AFFRI® introduces an automatic hardnesstester system for the future

SYSTEM AFFRI®

Since 1964 AFFRI® has being producing hardness testers combining test loads together with innovative devices which, together, make up the AFFRI SYSTEM®. The power supply can be mechanical, electro-mechanical, hydro-mechanical or pneumo-mechanical.

The AFFRI SYSTEM® has long surpassed the traditional philosophies using dead-weights and elevating screws found in conventional hardness testers.

The novel AFFRI SYSTEM® is protected by patents registered over the years.

An increase in operational performance had already been obtained using closed-loop load control (Patent AFFRI® N. 1175158), however, even this improvement is moderate in comparison with the high qualitative and practical performance levels reached by the AFFRI SYSTEM®.

A further improvement in performance was achieved when AFFRI® made the hardness tester, working in Rockwell and Brinell tests,truly automatic: a single initiation starts and performs the continous test sequence comprising positioning ,automatic contact and measurement.

The fully automatic control ensures that the speed throughout the entire test cycle remains unchanged even in the load-cell version due to the leading technology of the AFFRI SYSTEM® (patent pending).

ISO 9001:2000 REGISTERED

EQA UKAS QUALITY MANAGEMENT 047

Head office (Induno Olona Italy)

Manufacturing unit (Induno Olona - Italy)

Northern Europe sales and service (Brussells- Belgium)

HARDNESS CONVERSION TABLE FOR METALS

STEELS AND CAST IRON

TENSIL N.mm²	TENSIL σ Kg/mm²	VICKERS HV30	BRINELL HB30	For Rolls SHORE D	ROCKWELL C	ROCKWELL D	ROCKWELL A	SUPER ROCKWELL 45 N	SUPER ROCKWELL 30 N	SUPER ROCKWELL 15 N
		1710								
		1663								
		1556								
		1478								
		1400								
		1323								
		1245								
		1160								
		1076								
		1004								
		940			68	77	85.5	75.5	84.5	93.3
		903		105	67	76	85	74.5	83.5	93
		870		104	66	75.5	84.5	73	83	92.5
		840		103	65	74.5	84	72	82	92
		813		101	64	74	83.5	71	81	-
		787		99	63	73	83	70	80	91.5
		762		97	62	72.5	82.5	69	79	91
		738		94	61	71.5	81.5	67.5	78.5	90.5
		715		92	60	71	81	66.5	77.5	90
		693		90	59	70	80.5	65.5	76.5	89.5
		672		87	58	69	80	64	75.5	-
		652		84	57	68.5	79.5	63	75	89
		632		81	56	67.5	79	62	74	88.5
		612		79	55	67	78.5	61	73	88
		593		77	54	66	78	59.5	72	87.5
		575	HB30	76	53	65.5	77.5	58.5	71	87
		558		74	52	64.5	77	57.5	70.5	86.5
	497	542		72	51	64	76.5	56	69.5	86
	485	526		70	50	63	76	55	68.5	85.5
	475	510		69	49	62	75.5	54	67.5	85
	462	495		68	48	61.5	74.4	52.5	66.5	84.5
		480	450	67	47	60.5	74	51.5	66	84
		466	440	65	46	60	73.5	50	65	83.5
		453	433	64	45	59	73	49	64	83
		440	423	63	44	58.5	72.5	48	63	82.5
		428	413	61	43	57.5	72	46.5	62	82
		416	405	59	42	57	71.5	45.5	61.5	81.5
		404	395	58	41	56	71	44.5	60.5	81
		392	387	56	40	55.5	70.5	43	59.5	80.5
		381	377	55	39	54.5	70	42	58.5	80
		370	368	54	38	54	69.5	41	57.5	79.5
		360	359	53	37	53	69	39.5	56.5	79
		350	350	52	36	52.5	68.5	38.5	56	78.5
		341	341	51	35	51.5	68	37	55	78
		332	332	50	34	50.5	67.5	36	54	77
		323	323	49	33	50	67	35	53	76.5
		314	314	48	32	49	66.5	33.5	52	76
		306	306	46	31	48.5	66	32.5	51.5	75.5
		298	298	45	30	47.5	65.5	31.5	50.5	75
		290	290	44	29	47	65	30	49.5	74.5
		283	283	43	28	46	64.5	29	48.5	74
		276	276	42	27	45.5	64	28	47.5	73.5
		269	269	41	26	44.5	63.5	26.5	47	72.5
		262	262	40	25	44	63	25.5	46	72
		256	256	39	24	43	62.5	24	45	71.5
		250	250	38	23	42.5	62	23	44	71
		244	244	-	22	41.5	61.5	22	43	70.5
		239	239	37	21	41	61	20.5	42	70
		234	234	36	20	40	60	19.5	41.5	69.5
		225	225	35	18.5					
		216	216	34	16.5					
		210	210	33	15	D	A	45 N	30 N	15 N
		205	205	32	14					
		200	200	-	12.5					
		195	195	31	11					
		190	190	-	9.5					
		185	185		8					
		180	180		7					
		176	176		6					
		172	172		4.5					
		169	169		3					
		165	165		2					
		162	162		0					
		159	159							
		156	156							
		153	153							
		150	150							
		146	146							
		144	144							
		141	141							
		139	139							
		137	137							
		135	135							
		132	132							
		130	130							
		127	127							
		125	125							
		123	123							
		121	121							
		119	119							
		117	117							
		116	116							
		112	112							
		110	110							
		108	108							
		107	107							
		106	106							
		104	104							
		103	103							
		101	101							
		100	100							
		98	98							
		97	97							
		95	95							
		94	94							
		92	92							
		90	90							
		89	89							
		88	88							
		86	86							
		84	84							
		83	83							
		81	81							
		80	80							
N.mm²	Kg/mm²	HV30	HB30		C					

SCALE	TEST METHOD ROCKWELL indenter	LOAD N
HRC	∇ 120°	1471
HRA	∇ 120°	588
HRD	∇ 120°	981
HRB	Ø 1/16"	981
HRE	Ø 1/8"	981
HRF	Ø 1/16"	588
HRG	Ø 1/16"	1471
HRK	Ø 1/8"	1471
Superficial Rockwell		
HR15N	∇ 120°	147
HR30N	∇ 120°	294
HR45N	∇ 120°	441
HR15T	Ø 1/16"	147
HR30T	Ø 1/16"	294
HR45T	Ø 1/16"	441
BRINELL		
HB 10/3000	ball Ø 10 (HB 30)	29430
HB 5/750	ball Ø 5 (HB 30)	7357
HB 2.5/187.5	ball Ø 2.5 (HB 30)	1839
HB 2.5/62.5	ball Ø 2.5 (HB 10)	613
HB 10/500	ball Ø 10 (HB 5)	4905
HB 5/125	ball Ø 5 (HB 5)	1226
HB 2.5/31.2	ball Ø 2.5 (HB 5)	306
VICKERS		
HV10	diamond ◇ 136	981
HV15	diamond ◇ 136	147
HV30	diamond ◇ 136	294
HV60	diamond ◇ 136°	588

Minimum thickness measurable ROCKWELL ∇ Diam

F	HRC					
	20	30	40	50	60	70
HR15N	0.41	0.33	0.26	0.19	0.14	0.09
HR30N	0.69	0.58	0.47	0.36	0.26	0.17
HR45N	0.91	0.77	0.63	0.50	0.37	0.25
HRA	1.0	0.9	0.8	0.7	0.6	0.5
HRC	1.8	1.6	1.4	1.2	1.0	0.8
METALTESTER	0.38	0.32	0.26	0.20	0.14	0.08

Minimum thickness measurable BRINELL

ø	F	HB								
mm	N	40	60	80	100	150	200	300	400	500
2.5	1839	(HB / 30)			2.40	1.60	1.20	0.80	0.60	0.48
5	1226	2.0	1.3	1.0	0.80	0.53			(HB / 5)	
10	9810	8.0	5.3	4.0	3.2	2.1	1.6		(HB / 10)	
10	29430	(HB / 30)			9.6	6.3	4.8	3.2	2.4	1.9
METALTESTER		Scale 80-500		0.63	0.53	0.42	0.32	0.22	0.16	0.10
		0.53	0.42	0.32	0.27	0.15	0.10	Scale 40 - 200		

Minimum thickness measurable VICKERS ∇ Diam

F	HV								
Kg	20	50	100	200	300	400	600	800	1000
HV0.200	0.19	0.12	0.09	0.06	0.05	0.04	0.04	0.03	0.03
HV1	0.43	0.28	0.19	0.14	0.12	0.10	0.08	0.07	0.06
HV2	0.62	0.39	0.28	0.19	0.16	0.14	0.12	0.10	0.09
HV5	1.0	0.62	0.44	0.31	0.25	0.22	0.18	0.15	0.14
HV10	1.4	0.87	0.62	0.43	0.36	0.31	0.25	0.22	0.19
METALTESTER	0.70	0.60	0.50	0.37	0.32	0.26	0.18	0.08	0.06
METALTESTER/2	0.65	0.55	0.45	0.30	0.28	0.20	0.10	0.06	0.05

NON FERROUS METALS

VICKERS HV	BRINELL HB 5	ROCKWELL G	ROCKWELL K	ROCKWELL B	ROCKWELL A	ROCKWELL E	ROCKWELL F	SUPER ROCKWELL 45 T	SUPER ROCKWELL 30 T	SUPER ROCKWELL 15 T
		92								
		91								
		90								
		89								
		88								
		87								
		86								
		85								
		82						72	82	93
198	195	81		99	61			71	81.5	92.3
195	189	79		98	60			70	81	-
191	184	77		97	59.5			69	80.5	92
188	179	76		96	59			68	80	-
185	175	72		95	58			67	79	91.5
182	171	74		94	57.5			66	78.5	-
179	167	71		93	57			65.5	78	91
176	163	69	100	92	56.5			64.5	77.5	90.5
173	160	67	99	91	56			63.5	77	-
171	157	66	98	90	55.5			62	76	90
168	154	65	-	89	55			61	75.5	89.5
165	151	62	97	88	54			60.5	75	-
163	148	61	96	87	53.5			59.5	74.5	89
160	145	59	95	86	53			58.5	74	88.5
157	142	57	94	85	52.5			58	73.5	-
156	140	56	-	84	52			57	73	88
153	137	54	93	83	51			56	72	87.5
151	135	52	92	82	50.5			55	71.5	-
149	133	51	91	81	50			54	71	87
147	130	49	90	80	49.5			53	70	86.5
145	128	47	89	79	49			52	69.5	-
142	126	46	88	78	48.5			51	69	86
140	124	44	-	77	48			50	68	85.5
138	122	42	87	76	47			49	67.5	-
136	120	41	86	75	46.5			48.5	67	85
134	118	39	85	74	46			47	66	-
132	116	G	84	73	45.5			46.5	65.5	84
131	114		83	72	45			45.5	65	64
129	112		82	71	44.5			44	64	-
126	110		81	70	44			43	63.5	83.5
125	109		-	69	43.5	99		42.5	62.5	83
124	107		80	68	43	98		41.5	62	-
122	106		79	67	42.5	97		40.5	61.5	82.5
120	104		78	66	42	-		39.5	60.5	82
118	102		77	65	-	96		38.5	60	-
117	101		76	64	41.5	95		37.5	59.5	81.5
115	99		75	63	41	-		36.5	58.5	81
114	98		74	62	40.5	94		35.5	58	-
113	96		-	61	40	-		34.5	57	80.5
112	95		73	60	39.5	93		33.5	56.5	-
111	94		72	59	39	92		32	56	80
109	92		71	58	38.5	-		31	55	79.5
108	91		70	57	38	91		30	54.5	-
107	90		69	56	-	90		29	54	79
106	89		68	55	37.5	-		28	53	78.5
105	87		-	54	37	89		27	52.5	-
104	86		67	53	36.5	-		26	51.5	78
103	85		66	52	36	88		25	51	77.5
102	84		65	51	35.5	87		24	50.5	-
101	83		64	50	35	-		23	49.5	77
100	82		63	49	-	86	85	22	49	76.5
98	81		62	48	34.5	-	84	20.5	48.5	-
97	80		61	47	34	85	-	19.5	47.5	76
-	-		-	46	33.5	84	83	18.5	47	75.5
96	79		60	45	33	-	82	17	46	-
-	78		59	44	32.5	83	-	16	45.5	75
95	77		58	43	32	82	81	15.5	45	74.5
94	76		57	42	31.5	-	-	14.5	44	-
93	75		56	41	31	81	80	13.5	43.5	74
-	-		55	40	-	-	79	12.5	43	73.5
92	74		54	39	30.5	80	-	11	42	-
-	73		-	38	30	79	78	10	41.5	73
91	72		53	37	29.5	-	-	9	40.5	72.5
-	-		52	36	29	78	77		40	-
90	71		51	35	28.5	-	-	45 T	39.5	72
88	70		50	34	28	77	76		38.5	71.5
86	69		49	33	-	76	75		38	-
-	-		48	32	27.5	-	-		37.5	71
85	68		-	31	27	75	74		36.5	-
84	67		47	30	26.5	-	-		36	70.5
-	-		46	29	26	74	73		35.5	70
83	66		45	28	25.5	73	-		34.5	-
82	-		44	27	25	-	72		34	69.5
81	65		43	26	24.5	72	-		33	69
80	64		42	25	-	-	71		32.5	-
-	-		41	24	24	71	70		32	68.5
79	63		-	23	23.5	70	-		31	68
-	-		40	22	23	-	69		30.5	-
78	62		39	21	22.5	69	-		29.5	67.5
-	-		38	20	22	-	68		29	-
77	61		37	19	21.5	68	-		28.5	67
76	-		36	18	-	-	67		27.5	66.5
75	60		35	17	21	67	66		27	-
-	-		-	16	20.5	66	-		26	66
74	59		34	15	20	-	65		25.5	65.5
-	-		33	14	A	65	-		25	-
73	58		32	13		64	64		24	64
-	-		31	12		-	-		23.5	-
72	57		30	11		63	63		23	63.5
-	-		29	10		-	-		22.3	
71	56		-	9		62	62		21.5	
-	-		28	8		61	61		20.4	
69	54		27	7		-	-		20	
-	-		26	6		60	60			
67	53		25	5		-	-		30 T	15 T
-	-		24	4		59	59			
65	52		23	3		-	-			
-	-		K	2		58	58			
64	50			1		57	57			
-	49			0		-	-			
63	48			B		56	56			
61	47					54	54			
59	46					52	52			
-	45					51	51			
58	44					50	50			
56	43					48	49			
55	42					46	47			
53	41					44	46			
52	40					42	44			
51	39					40	42			
50	38					38	40			
48	37					36	38			
47	36					33	36			
45	35					30	32			
44	34					27	29			
42	33					24	26			
41	32					21	23			
40	31					17	19			
38	30					14	16			
37	28					E	F			
36	26									
33	24									
31	22									
28	21									
26	20									
23	18									
21	16									
19	14									
16	12									
HV	HB 5									

AFFRI®

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SCALE	SYMBOL	PENETRATOR	MINOR LOAD N	MAJOR LOAD N	FIELD OF APPLICATION
ROCKWELL	HRA	CONE 120°	98	588	Hardened Metals, cementation layers, thin sheet (>0.4 mm)
	HRB	BALL 1/16”	98	981	Non-ferrous metals, construction steel
	HRC	CONE 120°	98	1471	Tempered, cemented, hardened and quenched Steel
	HRD	CONE 120°	98	981	Cementated surface with a medium layer of cementation
	HRE	BALL 1/8”	98	981	Cast iron, alloy magnesium aluminium, anti-friction metals, plastic (ASTM D785-60T)
	HRF	BALL 1/16”	98	588	Alloy copper, sheet (> 0.6 mm.)
	HRG	BALL 1/16”	98	1471	Phosphorous bronze, beryllium copper, medium hardness tempered cast iron
	HRH	BALL 1/8”	98	588	Aluminium, zinc, lead abrasive stone
	HRK	BALL 1/8”	98	1471	Anti-friction metals and reduced hardness metals
	HRL	BALL 1/4”	98	588	Like HRK, hard rubber (AS TM D 530-59 T) synthetic materials (ASTM D 785-60 T)
	HRM	BALL 1/4”	98	981	Like HRK and HRL, chipboard panels (ASTM D 805-52)
	HRP	BALL 1/4”	98	1471	Like HRK, HRL, HRM
	HRR	BALL 1/2”	98	588	Like HRK, HRL, HRM
	HRS	BALL 1/2”	98	981	Like HRK, HRL, HRM
	HRV	BALL 1/2”	98	1471	Like HRK, HRL, HRM, HRP, HRR, HRS
SUPERFICIAL ROCKWELL	HR15N			147	
	HR30N	CONE 120°	29.4	294	Like HRA, HRC, HRD but for layers or thin sheet (> 0.15 mm)
	HR45N			441	
	HR15T			147	
	HR30T	BALL 1/16”	29.4	294	Like HRB, HRF, HRG but for thin sheet (> 0.25 mm)
	HR45T			441	
	HR15W			147	
	HR30W	BALL 1/8”	29.4	294	Softer metals, in thin layers eg thin anti-friction metal covering
	HR45W			441	
	HR15X			147	
	HR30X	BALL 1/4”	29.4	294	Sinterised metals (ASTM B 347-59 T)
	HR45X			441	
	HR15Y			147	
	HR30Y	BALL 1/2”	29.4	147	Like HRX
	HR45Y			441	
VICKERS	HV3	PIRAMID 136°		29.4	All metals (hard and soft)
	HV10	PIRAMID 136°		98	All metals (hard and soft)
	HV15	PIRAMID 136°		147	All metals (hard and soft)
	HV30	PIRAMID 136°		294	All metals (hard and soft)
	HV60	PIRAMID 136°		588	All metals (hard and soft)
BRINELL	HB T 30 C	2.5 Carbide ball		1839	Cast iron, steel with hardness above 400 HB
	HB T 30 S	2.5 Carbide ball		1839	Cast iron, steel with hardness below 400 HB
	HB T 10	2.5 Carbide ball		613	Aluminium, bronze, copper, brass
	HB 2.5	2.5 Carbide ball		153	Aluminium, bronze, copper, brass
	HB 5	2.5 Carbide ball		306	Aluminium, bronze, copper, brass
	HB 2.5	5 Carbide ball		1226	Aluminium, bronze, copper, brass
	HB 1.25	10 Carbide ball		1226	Aluminium, bronze, copper, brass
	HB 30	2.5 Carbide ball		1839	Steel, cast iron

AFFRI® instruments conform to International Standards and are fully certified by International Calibration Laboratory.

SIT

SERVIZIO DI TARATURA IN ITALIA
Calibration Service in Italy

Il SIT è uno dei firmatari dell'accordo multilaterale della European cooperation for the Accreditation of Laboratories (EAL) per il mutuo riconoscimento dei certificati di taratura.
SIT is one of the signatories to the Multilateral Agreement of EAL for the mutual recognition of calibration certificates

CENTRO DI TARATURA
Calibration Centre

istituito da
established by

TRASDUTTORI MISURE TARATURE

T.M.T.
Via S. Francesco d'Assisi, 8
10040 RIVALTA DI TORINO (TO)
Tel. (011) 909.10.04 - Fax 904.73.84

Pagina 1 di 4
Page of

CERTIFICATO DI TARATURA N. 8865
Certificate of Calibration No.

- Data di emissione / *date of issue*: 28/02/98
- destinatario / *addressee*: AFFRI – Induno Olona
- richiesta / *application*: ////
- in data / *date*: ////

Si riferisce a / *referring to*
- oggetto / *item*: MACCHINA PER PROVE DI DUREZZA
- costruttore / *manufacturer*: AFFRI
- modello / *model*: ///
- matricola / *serial number*: 970503
- data delle misure / *date of measurements*: 28/02/98
- registro di laboratorio / *laboratory reference*: 84 pag. 78

Il presente certificato di taratura è rilasciato in base all'accreditamento SIT N. 17/M concesso dall'Istituto Metrologico Primario competente in attuazione della legge n. 273/1991 che ha istituito il Sistema Nazionale di Taratura (SNT). Tale Istituto, nei campi di misura ed entro le incertezze precisate nell'accreditamento stesso, garantisce:
- il mantenimento della riferibilità degli apparecchi usati dal Centro a campioni nazionali delle unità del Sistema Internazionale delle Unità (SI);
- la correttezza metrologica delle procedure di misura adottate dal Centro.

This certificate of calibration is issued in accordance with the accreditation SIT No. 17/M guaranteed by the relevant Primary Metrological Institute in enforcement of the law No. 273/1991 which has established the National Calibration System. The Institute, for the measurement ranges and within the uncertainties stated in the approval, guarantees:
- the maintenance of the traceability of the apparatus used by the Centre to national standards of the International System of Units (SI);
- the metrological correctness of the measurement procedures adopted by the Centre.

I risultati di misura riportati nel presente Certificato sono stati ottenuti applicando le procedure riportate alla pagina seguente insieme ai campioni di prima linea che iniziano la catena di riferibilità e ai rispettivi certificati validi di taratura.

The measurement results reported in this certificate were obtained following the procedures reported in the following page together with the first line standards which begin the traceability chain and their valid certificates of calibration.

Le incertezze di misura dichiarate in questo documento sono espresse come due volte lo scarto tipo (corrispondente, nel caso di distribuzione normale, a un livello di confidenza di circa 95%).

The measurement uncertainties stated in this document are estimated at the level of twice the standard deviation (corresponding, in the case of normal distribution, to a confidence level of about 95%).

Il Responsabile del Centro
Head of the Centre
M.Vattasso

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Certification by direct and indirect method

SYSTEM AFFRI

PRODUCTION PROGRAM

HARDNESS TESTER MODEL ..... page

REFERENCE HARDNESS TESTER 1

AUTOMATIC ROCKWELL - BRINELL

3302 MRS 3
3332 MRS 5
3332 MRS A 7
3300 MRS 9
3301 MRSS 11
330 PRS 13
330 PRSS 15
250 MRS 17
330 RSD 19
330 SD 21
330 RS 23
330 S 25
270 RSD 27
270 SD 29
270 RS 31
270 S 33
331 RSD 35
331 SD 37
331 RS 39
331 S 41
206 RSD DIGITRONIC 43
206 SD DIGITRONIC 45
206 RS 47
206 S 49
250 DRMC 51
206 MX 53
206 MXS 55

ROCKWELL - BRINELL

206 RTD DIGITRONIC 57
206 RTSD DIGITRONIC 59
206 EX 61
206 EXS 63
206 RT 65
206 RTS 67

UNIVERSAL ROCKWELL - VICKERS - BRINELL

INTEGRAL 69
INTEGRAL E 71
270 VRSTV 73
270 VRST VM Auto 75
270 VRSD 77
770 VRSD 79
270 VRSA 81
251 VRSTV 83
251 VRSD 85
251 VRSA 87
MICROTESTER 89
MICRO AUTO VT 10 91

MICRO VICKERS

DM-2 93
DM-5 95
DM-8 97

SPECIAL MODELS

MATRIX CRANKSHAFT + CAMSHAFT TESTER MATRIX 99

AUTOMATIC BRINELL

LD3000AF 100
EASY BRINELL 101
CK3000 103
AUTO3000 104

PORTABLES

PERCUSSION 105
HARD TEST 107
METALTESTER MKII 109
METALTEST 111

FOR PLASTIC MATERIALS

PORTABLE AND LABORATORY SHORE 112
ELECTRONIC HARDNESS TESTER 115
IRHD M - Shore 117
150 PLAST 119
PJ 120

MICROSCOPES

MICROSCOPE 1216 121

SPECIAL TESTS

MRS-FRU 123

SPECIAL APPLICATIONS

AUTO PRS 124
AUTO GM 125

ACCESSORIES

SPECIAL ACCESSORIES 131
SOFTWARE 132
DIAMOND INDENTERS 135

TEST BLOCKS

STANDARD TEST BLOCKS 137

HOW TO READ AFFRI'S CATALOGUE

P	Motorised pneumatic action
M	Motorised electrical action
RS	Rockwell semiautomatic« AFFRI SYSTEM » inside
S	Superficial Rockwell
D	Digital
RT	Traditional Rockwell system (manual cycle)
EX	Economic Rockwell manual cycle
MX	Economic Rockwell motorised cycle
V	Vickers
TV	Vision trough camera
VM	Vickers Micro

SYSTEM AFFRI

REFERENCE HARDNESS TESTER

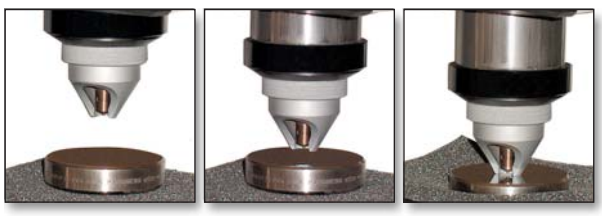
Reference Hardness Tester for calibration laboratories

This highly accurate Hardness Tester is designed for laboratories calibrating Test Blocks. It includes Affri System technology and a fully automatic system to perform calibration in accordance with the International Standards.ASTM, EN ISO-JSO.

- ***Integral AFFRI System***
- ***Absolute measurement***
- ***The Start button initiates an uninterrupted test sequence comprising:***
  - ***approach the piece***
  - ***clamping***
  - ***impression of reference surface***
  - ***complete measurement cycle with subsequent release***
- ***The result is not influenced by deflections during the test cycle***
- ***Large and fixed table supporting test pieces***

Designed for different applications: A) EN ISO 6508-3 for Rockwell; B) EN ISO 6508-3 for Super Rockwell; C) EN ISO 6506-3 for Brinell; D) EN ISO 6507-3 for Vickers
The excellent accuracy and repeatability fully meet the requisite standards. A table of practical results obtained on AFFRI machines and another reference machine shows AFFRI's high comparable performance (①):
The integral Affri system of this machine operates on the same principle as that adopted in the regular production machines shown this catalogue.

AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE

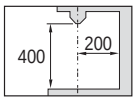


Values obtained with Master reference hardness tester and with Affri reference hardness tester using the same indenter and test blocks for the range (26 HRC, 44 HRC, 65 HRC)

①

	Nominal Hardness 26 HRC		Nominal Hardness 44 HRC		Nominal Hardness 65 HRC	
	Master Reference Tester (HRC)	**AFFRI Reference Tester (HRC)**	Master Reference Tester (HRC)	**AFFRI Reference Tester (HRC)**	Master Reference Tester (HRC)	**AFFRI Reference Tester (HRC)**
	26.05	26.34	44.27	44.31	64.99	65.17
	26.13	26.64	44.28	44.34	65.04	65.12
	26.20	26.25	44.29	44.32	65.11	65.16
	26.32	26.18	44.25	44.32	65.07	65.20
	26.34	26.21	44.24	44.32	65.16	65.16
Average	26.21	**26.32**	44.27	**44.32**	65.07	**65.16**
Standard deviation	0.12	**0.19**	0.02	**0.01**	0.07	**0.03**

SYSTEM AFFRI



AUTOMATIC ROCKWELL - SUPER ROCKWELL - BRINELL - VICKERS

- **Unparalleled Accuracy, Repeatibility and Reproducability** under all test conditions which can be verified under operational conditions R. & R. within 8%
- Measurement of load and indenter penetration on a common axis, giving an absolute hardness result
- Graphical illuminated display to obtain clear and accurate readings. Icons facilitate operator identification of software functions.
- Signal of test cycle end to aid the operator
- **Automatic control and selection of pre-loads and main loads** using closed-loop load control (AFFRI® patent)
- Single button operator selection of test load and measurement scale
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers and tensile stress N/mm^2).
- **High precision rapid testing**
- The instrument and its controls are ergonomically provided with security devices according to CE norms
- Effective statistics software incorporated with printer or computer connection for: diagram, graph, test summary, average, standard deviation.
- Software includes settings in three selectable classes to facilitate integration of the instrument into automatic lines
- Programmable load dwell time 0.1 second increment
- Automatic correction on round surfaces and storage of results
- High resolution of measurement 0.1 (or 0.01 HR unit on request)
- Reversion from automatic to semi-automatic mode for single tests
- **Two years full warranty** as assurance of the high technical quality.
- Wide range of accessories in order to accommodate pieces of different shapes

VERY HIGH PERFORMANCE

- Unaltered operation even under extreme conditions eg irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support ⑤.

CERTIFICATION

- Supplied with certificates on SIT primary samples

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Technical characteristics

Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Vickers Knoop loads	(3 5 10 15 20 30 60 100 120 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 1177 N
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 - EN-ISO 2039
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30, HB 10, HB 5, HB 2.5; Break N/mm^2 Superficial Rockwell HRN+HRT Vickers (indentations only) EN-ISO 2039
Mode of operation	automatic with load cell and closed loop Affri patent
Action	A single initiation lowers the head to make contact and clamp the test surface from 0 to 400 mm in distance multiples of 50 mm and automatically starts the hardness cycle in automatic sequence comprising: auto contact; clamping of the piece; indentation of the surface; measurement and release of the test piece
Mobile Indenter	from 0 to 400 mm
Self clamping	100 N
Self aligning to test surface	from 0 to 400 mm
Automatic compensation of deflection piece from 0 to 400 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Digital reading	Rockwell - Brinell (Vickers conversion) Resolution: 0.1 HR - 0.1HB (0.01 HR unit, on request)
Total height capacity	400 mm motorised (more upon request)
Total depth capacity	200 mm
Dimension of base	330x390 mm
Max load of test piece	2000 Kg
Power supply	220V 50÷60Hz - 200VA
Fields of application: for all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastics	
Net weight	120 Kg
Packing weight	160 Kg
Packing measurements	70x72xH190

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Table to support hardness tester
- Printer

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers 136° indenter
- Vickers test blocks
- Microscope 1216 for Vickers-Brinell measurements

Brinell
- Ball penetrator 1 - 2.5 - 5 mm
- Brinell test block for ball 1 - 2.5 - 5 mm

EN-ISO 2039 for plastic
- Ball penetrator 5 mm for EN ISO 2039
- Large clamping base for EN ISO 2039
- Test block for EN ISO 2039 scale

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-3302 MRS

3302 MRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE. ⑥

- Following initiation by the Start button, the 3302 MRS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test

SIMPLE AND UNIVERSAL

- Easy and quick Rockwell, SuperRockwell, Brinell, Vickers measurements in a single machine
- Every environmental condition is tolerable: presence of dust, vibration, changes of temperature, deflection of sample
- With automatic stroke and extension of indenter, it is easy to operate test on internal surfaces. ②
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ⑦
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑤
- Large Range of test loads (from 9.81 to 1839N) automatically selectable
- Long stroke from 0 to 400 mm fully motorised (or higher upon request)

CE

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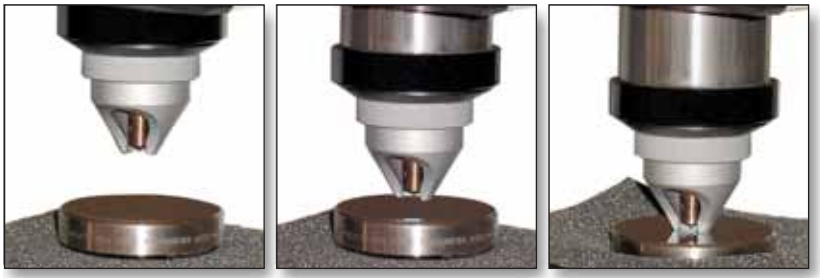
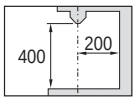
⑥ AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





AUTOMATIC ROCKWELL - SUPER ROCKWELL - BRINELL - VICKERS

- **Unparalleled Accuracy, Repeatability and Reproducibilit** under all test conditions which can be checked in operation conditions R. & R. within 8%
- Measurement of load and indenter penetration on a common axis, giving an absolute hardness result
- Graphical illuminated display to obtain clear and accurate readings. Icons facilitate operator identification of software functions.
- Signal of test cycle end to aid the operator
- **Automatic control and selection of pre-loads** and main loads using closed-loop load control (AFFRI® patent)
- **Single button operator selection** of test load and measurement scale
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers and tensile stress N/mm^2).
- **High precision rapid testing**
- The instrument and its controls are ergonomically provided with security devices according to CE norms
- Effective statistics software incorporated with printer or computer connection for: diagram, graph, tests summary, average, standard deviation.
- Software includes settings in three selectable classes to facilitate integration of the instrument into automatic lines
- Programmable load dwell time 0.1 second increment
- Automatic correction on round surfaces and storage of results
- High resolution of measurement 0.1 (or 0.01 HR unit on request)
- Reversion from automatic to semi-automatic mode for single tests
- **Two years full warranty** as assurance of the high technical quality.
- Wide range of accessories in order to accommodate pieces of different shapes

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VERY HIGH PERFORMANCE

- Unaltered operation even under extreme conditions: irregular, unfinished, raised or misaligned pieces, all kinds of supports (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support. ⑤

CERTIFICATION

- Supplied with certificates on SIT primary samples

Technical characteristics

Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N	
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N	
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N	
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)	
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N	
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell	
Shore	A - B - C - D	
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 - EN-ISO 2039	
Feasible tests Twin	Rockwell HRC A D B F G L M R Superficial Rockwell HRN+HRT	Brinell HB 30, HB 10, HB 5, HB 2.5; Break N/mm^2 EN-ISO 2039
Mode of operation	automatic with load cell and closed loop Affri patent	
Action	A single initiation lowers the head to make contact and clamp the test surface from distance multiples of 50 mm and automatically starts the hardness cycle in automatic succession comprising: auto contact; clamping of the piece; indentation of the reference surface; measurement and release of the test piece	
Mobile Indenter	from 0 to 50 mm	
Self clamping	200 ÷ 4000 N	
Self aligning to test surface: from 0 to 50 mm		
Automatic compensation of deflection piece from 0 to 400 mm		
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Digital reading	Rockwell - Brinell (Vickers conversion) Resolution: 0.1 HR - 0.1HB (0.01 HR unit, on request)	
Floating head	from 0 to 50 mm multiples, till 400 mm	
Total height capacity	400 mm (more upon request) manual	
Total depth capacity	200 mm	
Dimension of base	330x390 mm	
Max load of test piece	2000 Kg	
Power supply	220V 50÷60Hz - 200VA	
Fields of application: For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastics		
Net weight	100 Kg	
Packing weight	140 Kg	
Packing measurements	70x72xH100	

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Table to support hardness tester
- Printer

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers 136° indenter
- Vickers test blocks
- Microscope 1216 for Vickers-Brinell measurements

Brinell
- Ball penetrator 1 - 2.5 - 5 mm
- Brinell test block for ball 1 - 2.5 - 5 mm

EN-ISO 2039 for plastic
- Ball penetrator 5 mm for EN ISO 2039
- Large clamping base for EN ISO 2039
- Test block for EN ISO 2039 scale

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

CE

For more information require catalogue 01.01-3302 MRS

3332 MRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑥

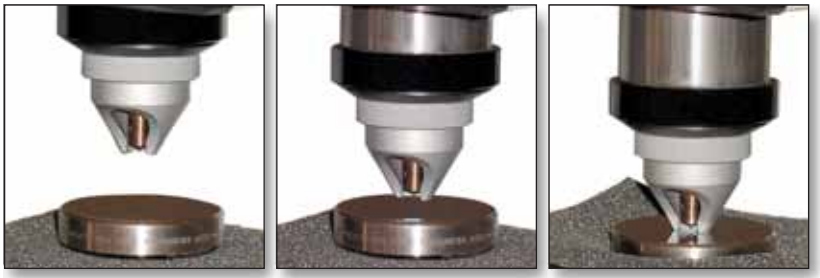
- Following initiation by the Start button, the 3332 MRS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test

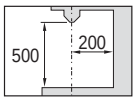
SIMPLE AND UNIVERSAL

- Easy and quick Rockwell, SuperRockwell, Brinell, Vickers measurements in a single machine
- Every environmental condition is tolerable: presence of dust, vibration, changes of temperature, deflection of sample
- With automatic stroke and extension of the indenter, it is easy to operate tests on internal surfaces. ②
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑤
- Large Range of test loads from 9.81 to 1839N automatic selectable
- Long stroke from 0 to 400 mm (or higher upon request)

⑤

⑥ AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





- **Unparalleled Accuracy, Repeatability and Reproducibility** under all test conditions which can be verified under operational conditions R. & R. within 8%
- Measurement of load and indenter penetration on a common axis, giving an absolute hardness result
- Graphical illuminated display to obtain clear and accurate readings. Icons facilitate operator identification of software functions.
- Signal of test cycle end to aid the operator
- **Automatic control and selection of pre-loads and main loads** using closed-loop load control (AFFRI® patent)
- **Single button operator selection** of test load and measurement scale
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers and tensile stress N/mm^2).
- **High precision rapid testing**
- The instrument and its controls are ergonomically provided with security devices according to CE norms
- Effective statistics software incorporated with printer or computer connection for: diagram, graph, tests summary, average, standard deviation.
- Software includes settings in three selectable classes to facilitate integration of the instrument into automatic lines
- Programmable load dwell time 0.1 second increment
- Automatic correction on round surfaces and storage of results
- High resolution of measurement 0.1 (or 0.01 HR unit on request)
- Reversion from automatic to semi-automatic mode for single tests
- **Two years full warranty** as assurance of the high technical quality.
- Wide range of accessories in order to accommodate pieces of different shapes

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished, raised or misaligned pieces, all kinds of supports (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support. ⑤

CERTIFICATION

- Supplied with certificates on SIT primary samples

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Technical characteristics

Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N	
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N	
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N	
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)	
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N	
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell	
Shore	A - B - C - D	
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 - EN-ISO 2039	
Feasible tests Twin	Rockwell HRC A D B F G L M R Superficial Rockwell HRN+HRT	Brinell HB 30, HB 10, HB 5, HB 2.5; Break N/mm^2 EN-ISO 2039
Mode of operation	automatic with load cell and closed loop Affri patent	
Action	A single initiation lowers the head to make contact and clamp the test surface from distance multiples of 50 mm and automatically starts the hardness cycle in automatic succession comprising: auto contact; clamping of the piece; indentation of the reference surface; measurement and release of the test piece	
Mobile Indenter	from 0 to 500 mm	
Self clamping	100 N	
Self aligning to test surface: from 0 to 500 mm		
Automatic compensation of deflection piece from 0 to 400 mm		
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy	
Temperature range	+ 5° to + 50° C	
Digital reading	Rockwell - Brinell (Vickers conversion) Resolution: 0.1 HR - 0.1HB (0.01 HR unit, on request)	
Floating head	from 0 to 500 mm without break including test cycle	
Total height capacity	500 mm (more upon request) motorised	
Total depth capacity	200 mm	
Dimension of base	330x390 mm	
Max load of test piece	2000 Kg	
Power supply	220V 50÷60Hz - 200VA	
Fields of application: for all metals: iron, steel, tempered steel, bronze, aluminium and nitrided, cementation, hardened face, plastics		
Net weight	100 Kg	
Packing weight	140 Kg	
Packing measurements	70x72xH100	

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Table to support hardness tester
- Printer

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers 136° indenter
- Vickers test blocks
- Microscope 1216 for Vickers-Brinell measurements

Brinell
- Ball penetrator 1 - 2.5 - 5 mm
- Brinell test block for ball 1 - 2.5 - 5 mm

EN-ISO 2039 for plastic
- Ball penetrator 5 mm for EN ISO 2039
- Large clamping base for EN ISO 2039
- Test block for EN ISO 2039 scale

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-3302 MRS

3332 MRS A

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑤

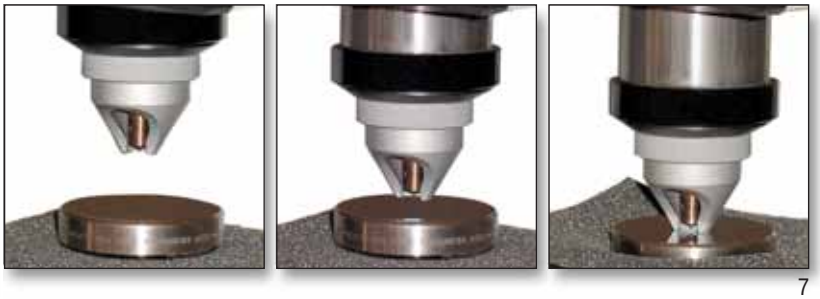
- Following initiation by the Start button, the 3332 MRS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test

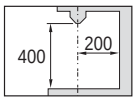
SIMPLE AND UNIVERSAL

- Easy and quick Rockwell, SuperRockwell, Brinell, Vickers measurements in a single machine
- Every environmental condition is tolerable: presence of dust, vibration, changes of temperature, deflection of sample
- With automatic stroke and extension of indenter, it is easy to operate test on internal surface. ②
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④
- Large Range of test loads from 9.81 to 1839N automatic selectable
- Long stroke from 0 to 500 mm (or higher upon request)

option: light signal for fast selection go-no go

⑤ AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





AUTOMATIC ROCKWELL - BRINELL

- **Unparalleled Accuracy, Repeatability and Reproducibility** under all test conditions which can be verified under operational conditions R. & R. within 8%
- Measurement of load and indenter penetration on a common axis, giving an absolute hardness result
- Graphical illuminated display to obtain clear and accurate readings. Icons facilitate operator identification of software functions.
- Signal of test cycle end to aid the operator
- **Automatic control and selection of pre-loads and main loads** using closed-loop load control (AFFRI® patent)
- **Single button operator selection** of test load and measurement scale
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers and tensile stress N/mm^2).
- **High precision rapid testing**
- The instrument and its controls are ergonomically provided with security devices according to CE norms
- Effective statistics software incorporated with printer or computer connection for: diagram, graph, tests summary, average, standard deviation.
- Software includes settings in three selectable classes to facilitate integration of the instrument into automatic lines
- Programmable load dwell time 0.1 second increment
- Automatic correction on round surfaces and storage of results
- High resolution of measurement 0.1 (or 0.01 HR unit on request)
- Reversion from automatic to semi-automatic mode for single tests
- **Two years full warranty** as assurance of the high technical quality.
- Wide range of accessories in order to accommodate pieces of different shapes

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished, raised or misaligned pieces, all kinds of supports (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support. ⑤

CERTIFICATION

- Supplied with certificates on SIT primary samples

①

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④

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads on request	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Feasible tests	Rockwell HRC A D B F G L M R Brinell HB 30, HB 10, HB 5, R N/mm^2
Mode of operation	automatic with load cell and closed loop Affri patent
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece
Digital reading	Rockwell - Brinell (Vickers conversion)
Reading resolution	0.1 HR - 0.1HB (0.01 HR unit, on request)
Accuracy	Conforms with standards EN-ISO 6506 / 6507 / 6508 / ASTM-E18
Floating head	from 0 to 400 mm without breach
Total height capacity	400 mm motorised (more upon request)
Total depth capacity	200 mm
Dimension of base	330x390 mm
Max load of test piece	2000 Kg
Clamping of piece	included
Data output	RS 232 C
Piece selection	Hard + Soft + Ok
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, bronze, aluminium. Thickness over 0.6 mm
Net weight	110 Kg
Packing weight	125 Kg
Packing measurements	72x72xH190 cm

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks
- Microscope 1216 for Vickers-Brinell measures

CE

For more information refer to catalogue 01.01-3302 MRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE. ⑥

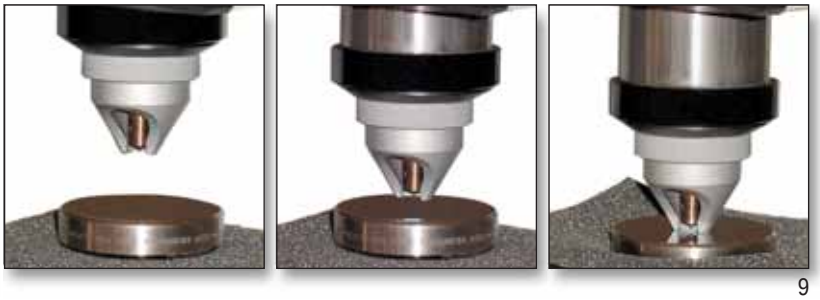
- Following initiation by the Start button, the 3300 MRS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test

SIMPLE AND UNIVERSAL

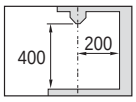
- Easy and quick Rockwell, SuperRockwell, Brinell, Vickers measurements in a single machine
- Every environmental condition is tolerable: presence of dust, vibration, changes of temperature, deflection of sample
- With automatic stroke and extension of indenter, it is easy to operate test on internal surface. ②
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑤
- Large Range of test loads from 98.1 to 1839N automatic selectable
- Long stroke from 0 to 400 mm fully motorised (or higher upon request)

⑤

⑥ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

- **Unparalleled Accuracy, Repeatability and Reproducibility** under all test conditions which can be verified under operational conditions R. & R. within 8%
- Measurement of load and indenter penetration on a common axis, giving an absolute hardness result
- Graphical illuminated display to obtain clear and accurate readings. Icons facilitate operator identification of software functions.
- Signal of test cycle end to aid the operator
- **Automatic control and selection of pre-loads and main loads** using closed-loop load control (AFFRI® patent)
- **Single button operator selection** of test load and measurement scale
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers and tensile stress N/mm^2).
- **High precision rapid testing**
- The instrument and its controls are ergonomically provided with security devices according to CE norms
- Effective statistics software incorporated with printer or computer connection for: diagram, graph, tests summary, average, standard deviation.
- Software includes settings in three selectable classes to facilitate integration of the instrument into automatic lines
- Programmable load dwell time 0.1 second increment
- Automatic correction on round surfaces and storage of results
- High resolution of measurement 0.1 (or 0.01 HR unit on request)
- Reversion from automatic to semi-automatic mode for single tests
- **Two years full warranty** as assurance of the high technical quality.
- Wide range of accessories in order to accommodate pieces of different shapes

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished, raised or misaligned pieces, all kinds of supports (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support. ⑤

CERTIFICATION

- Supplied with certificates on SIT primary samples

①

②

③

④

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads on request	(15-30-45 kgf) Rockwell superficiale 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Feasible tests	Superficial Rockwell HRN+HRT Brinell HB 30, HB 5, HB 2.5
Mode of operation	automatic with load cell and closed loop Affri patent
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece
Digital reading	Rockwell - Brinell (Vickers conversion)
Reading resolution	0.1 HR - 0.1HB (0.01 HR unit, on request)
Accuracy	Conforms with standards EN-ISO 6506 / 6507 / 6508 / ASTM-E18
Floating head	from 0 to 400 mm without breach
Total height capacity	400 mm motorised (more upon request)
Total depth capacity	200 mm
Dimension of base	330x390 mm
Max load of test piece	2000 Kg
Clamping of piece	included
Data output	RS 232 C
Piece selection	Hard + Soft + Ok
Power supply	220V 50÷60Hz - 200VA
Fields of application	Nitriding, cementation, hardened face with depth above 0.6 mm
Net weight	110 Kg
Packing weight	125 Kg
Packing measurements	70x72xH190

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Printer
- Table to support hardness tester

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-3302 MRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑥

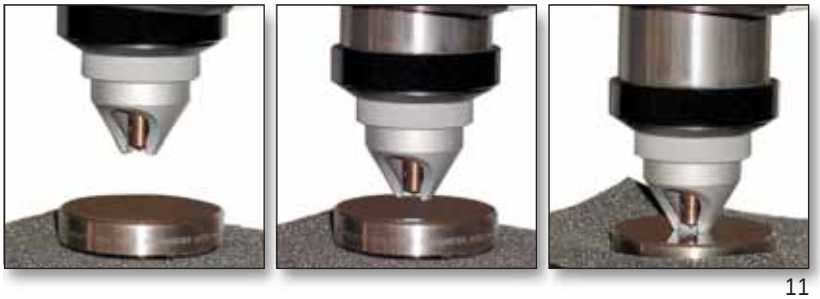
- Following initiation by the Start button, the 3301 MRS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test

SIMPLE AND UNIVERSAL

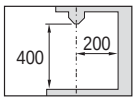
- Easy and quick Rockwell, Superrockwell, Brinell, Vickers measurements in a single machine
- Every environmental condition is tolerable: presence of dust, vibration, changes of temperature, deflection of sample
- With automatic stroke and extension of indenter, it is easy to measure internal surfaces. ②
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for rigid and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested
- Accessories can be applied on the table to accommodate irregular test pieces ③ ④ ⑤
- Large Range of test loads from 29.4 to 441N automatic selectable
- Long stroke from 0 to 400 mm fully motorised (or higher upon request)

⑤

⑥ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC ROCKWELL - BRINELL HIGH SPEED

- **High speed hardness tester** for rapid tests in production departments. A single initiation executes a complete automatic hardness test including clamping the piece. 1000 tests per hour throughput can be achieved.
- Direct readout in Rockwell or Brinell hardness scales (programmed in Affri factory prior to despatch -others available on request)
- Programmable tolerances and electrical data output for rapid testing Piece sorted in 3 catagories Ok - Hi - Lo
- **Very easy to integrate into a conveyor line.** The auto contact capability with clamping and automatic cycle including long stroke head of the AFFRI® system facilitates integration of the 330 PRS to an existing conveyor line. If required, Affri can design and build a full conveyor line with automatic part handling based on end User specifications.

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions.

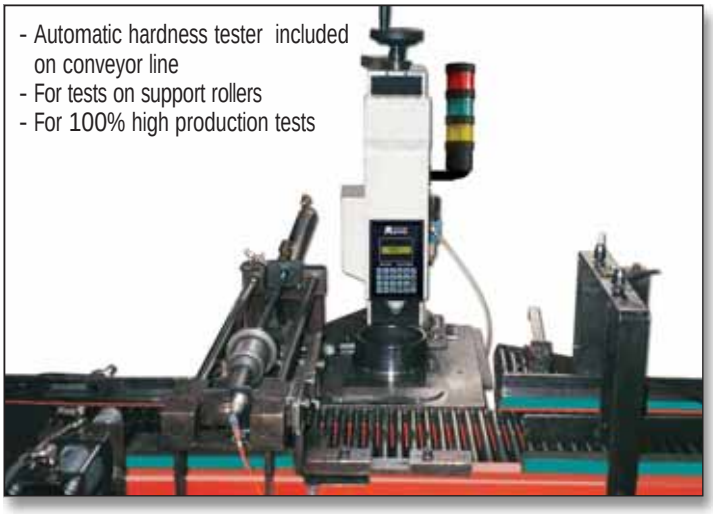
A SINGLE INPUT TO START THE AUTOMATIC SEQUENCE without interruption applies the minor and major load and measures the Rockwell indentation automatically. All test operations are managed through a single start command to reduce operator fatigue and to increase test repeatability and accuracy to the maximum ①.

AUTOMATIC CONTACT WITH THE TEST PIECE. The AFFRI® system can perform automatic contact with the test piece surface without moving the piece. It automatically moves the indenter and the measuring system until contact is made, the piece is clamped, the force applied and the indentation is measured automatically using Rockwell, Vickers or Brinell procedures.

- The system is capable of measuring accurately even if the test piece deflects up to 50 mm during measurement. This automatic compensation provide accurate results under adverse test conditions.
- External source of vibration do not influence the result.
- The test piece is CLAMPED AUTOMATICALLY and locked in position before the test force (20 to 400 Kgf) is applied.
- The test forces are controlled test by test using a load cell and closed loop Affri system to assure high performance conforming to ISO Standards.
- Perfect and effective measurements including the first test due to the AFFRI® system inside
- Accuracy is stable in every condition
- No need to be levelled when installed
- It can be utilised by untrained operators – initiate the single start input and wait for the test result
- An emergency push button is also included

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads on request	(60 100 150 Kgf) Rockwell 588-980-1471 N (62.5-125-187.5 Kgf) Brinell 612-1225-1839 N
Feasible tests	Rockwell HRC A D B F G L M R Brinell HB 30, HB 10, HB 5, R N/mm²
Mode of operation	automatic with load cell and closed loop Affri patent
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece
Digital reading	Rockwell - Brinell (Vickers conversion)
Reading resolution	0.1 HR - 0.1HB (0.01 HR unit, on request)
Accuracy	Conforms with standards EN-ISO 6506 / 6507 / 6508 / ASTM-E18
Floating head	50 mm motorised
Total height capacity	from 0 to 400 mm
Total depth capacity	200 mm
Dimension of base	330x390 mm
Max load of test piece	2000 Kg
Clamping pressure of piece	from 20 to 500 Kgf (from 196 to 4905) N
Clamping of piece	included
Data output	RS 232 C
Piece selection	Hard + Soft + Ok
Power supply	220V 50÷60Hz - 200VA / Pneumatic 4 bar
Fields of application: for all metals: iron, steel, tempered steel, bronze, aluminium. Thickness over 0.6 mm	
Net weight	110 Kg
Packing weight	125 Kg
Packing measurements	72x72xH190 cm



- Automatic hardness tester included on conveyor line
- For tests on support rollers
- For 100% high production tests

Fully automatic unit designed for rapid testing.
Up to 2000 pieces per hours on gear parts for cars.

Special fixing for tools

Applicable accessories

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

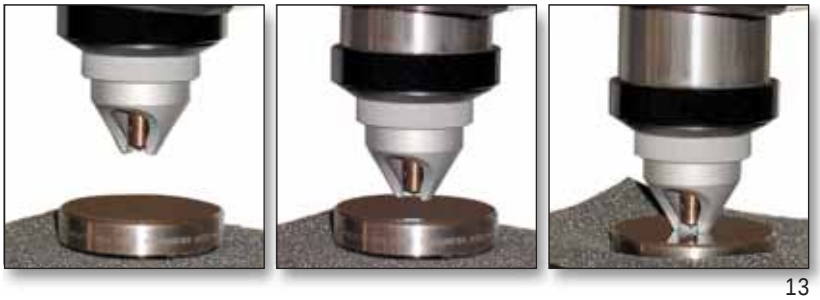
Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

CE

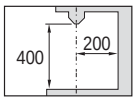
For more information refer to catalogue 01.01-330 PRS

Option: light signal for fast selection go-no go

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



SYSTEM AFFRI®



AUTOMATIC ROCKWELL - BRINELL HIGH SPEED

- **High speed hardness tester** for rapid tests in production departments. A single initiation executes a complete hardness test including automatically clamping of the test piece. Up to 1000 tests per hour can be performed.
- Direct readout in Rockwell or Brinell hardness scales (pre-programmed prior to despatch - others available on request)
- Programmable tolerance and electrical data output for rapid testing. Piece segregation into 3 classes Ok - Hi - Lo
- **Very easy to integrate into a conveyor line.** The fully automated features of the AFFRI® system, including auto contact ,clamping ,automatic cycle and long stroke head permits easy integration of the 330 PRS into an existing conveyor line. A full conveyor line and automatic selector line can also be designed and built by Affri based on customer's specifications.

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions.

A SINGLE INPUT TO START THE AUTOMATIC SEQUENCE without interruption applies the minor and major load and measures the Rockwell indentation automatically. All test operations are managed through a single start command to reduce operator fatigue and to increase test repeatability and accuracy to the maximum ①.

AUTOMATIC CONTACT WITH THE TEST PIECE. The AFFRI® system can perform automatic contact with the test piece surface without moving the piece. It automatically moves the indenter and the measuring system until contact is made, the piece is clamped, the force applied and the indentation is measured automatically using Rockwell, Vickers or Brinell procedures.

- The system is capable of measuring accurately even if the test piece deflects up to 50 mm during measurement. This automatic compensation provide accurate results under adverse test conditions.
- External source of vibration do not influence the result.
- The test piece is CLAMPED AUTOMATICALLY and locked in position before the test force (20 to 400 Kgf) is applied.
- The test forces are controlled test by test using a load cell and closed loop Affri system to assure high performance conforming to ISO Standards.
- Perfect and effective measurements including the first test due to the AFFRI® system inside
- Accuracy is stable in every condition
- No need to be levelled when installed
- It can be utilised by untrained operators – initiate the single start input and wait for the test result
- An emergency push button is also included

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 Kgf) Rockwell 147-294-441 N (15.6-31.2 Kgf) Brinell 153-306 N
Mode of operation	automatic with load cell and closed loop Affri patent
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece
Action	through lever with rack
Feasible tests	Rockwell sup. HRN+HRT Brinell HB 30; HB 5; HB 2.5
Digital reading	Rockwell - Brinell (Vickers conversion)
Reading resolution	0.1 HR - 0.1HB (0.01 HR unit, on request)
Accuracy	Conforms with standards EN-ISO 6506 / 6507 / 6508 / ASTM-E18
Floating head	from 0 to 400 mm without breach
Total height capacity totale	400 mm (more upon request)
Total depth capacity	200 mm
Base	330x390 mm
Max load of test piece	2000 Kg
Clamping pressure of piece	from 20 to 500 Kgf (from 196 to 4905) N
Data output	RS 232 C
Piece selection	Hard + Soft + Ok
Power supply	220V 50÷60Hz - 200VA / Pneumatic 4 bar
Fields of application: for all metals: iron, steel, tempered steel, bronze, aluminium. Thickness over 0.6 mm	
Net weight	110 Kg
Packing weight	125 Kg
Packing measurements	72x72xH190 cm

- Automatic hardness tester included on conveyor line
- For tests on support rollers
- For 100% high volume testing

Fully automatic unit equipped for high speed testing. Up to 2000 pieces per hour on car gear parts.

Special fixing for tools

Applicable accessories

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

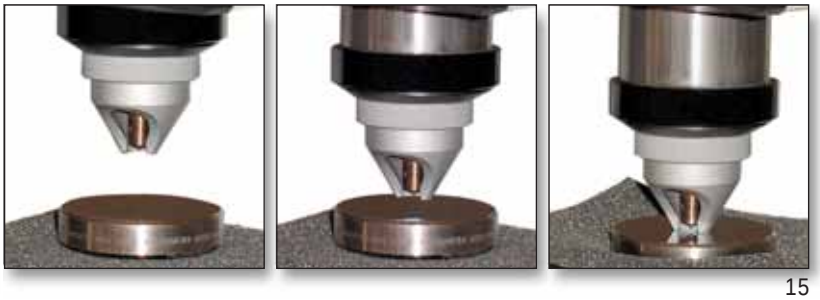
Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

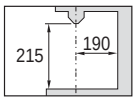
CE

For more information refer to catalogue 01.01-330 PRS

Option: light signal for fast selection go-no go

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





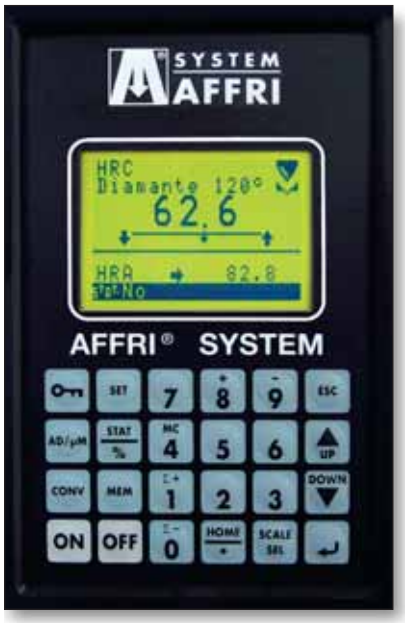
AUTOMATIC ROCKWELL - SUPER ROCKWELL - BRINELL - VICKERS

- **Unparalleled Accuracy, Repeatability and Reproducibility** under all test conditions which can be verified under operational conditions R. & R. within 8%
- Measurement of load and indenter penetration on a common axis, giving an absolute hardness result
- Graphical illuminated display to obtain clear and accurate readings. Icons facilitate operator identification of software functions.
- Signal of test cycle end to aid the operator
- **Automatic control and selection of pre-loads and main loads** using closed-loop load control (AFFRI® patent)
- **Single button operator selection** of test load and measurement scale
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers and tensile stress N/mm^2).
- **High precision rapid testing**
- The instrument and its controls are ergonomically provided with security devices according to CE norms
- Effective statistics software incorporated with printer or computer connection for: diagram, graph, tests summary, average, standard deviation.
- Software includes settings in three selectable classes to facilitate integration of the instrument into automatic lines
- Programmable load dwell time 0.1 second increment
- Automatic correction on round surfaces and storage of results
- High resolution of measurement 0.1 (or 0.01 HR unit on request)
- Reversion from automatic to semi-automatic mode for single tests
- **Two years full warranty** as assurance of the high technical quality.
- Wide range of accessories in order to accommodate pieces of different shapes

CERTIFICATION

- Supplied with certificates on SIT primary samples

- Automatic clamping



Technical characteristics

Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - extra 250 Kgf on request) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18 - EN-ISO 2039
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30, HB 10, HB 5, HB 2.5; Break N/mm^2 Superficial Rockwell HRN+HRT EN-ISO 2039
Mode of operation	automatic with load cell and closed loop Affri patent
Action	A single initiation lowers the head to make contact and clamp the test surface from distance multiples of 50 mm and automatically starts the hardness cycle in automatic succession comprising: auto contact; clamping of the piece; indentation of the reference surface; measurement and release of the test piece
Mobile Indenter	from 0 to 50 mm
Self clamping	200 ÷ 4000 N
Self aligning to test surface: from 0 to 50 mm	
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Digital reading	Rockwell - Brinell (Vickers conversion) Resolution: 0.1 HR - 0.1 HB - 0.1 HV (0.01 HR unit, on request)
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Power supply	220V 50÷60Hz - 200VA
Fields of application: for all metals: iron, steel, tempered steel, bronze, aluminium and nitrided, cementation, hardened face, plastics	
Net weight	75 Kg
Packing weight	90 Kg
Packing measurements	37x60x100 cm

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers 136° indenter
- Vickers test blocks
- Microscope 1216 for Vickers-Brinell measures

Brinell
- Ball penetrator 1 - 2.5 - 5 mm
- Brinell test block for ball 1 - 2.5 - 5 mm

EN-ISO 2039 for plastic
- Ball penetrator 5 mm for EN ISO 2039
- Large clamping base for EN ISO 2039
- Test block for EN ISO 2039 scale

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-250 MRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ②

- Following initiation by the Start button, the 250 MRS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflections
- Automatic compensation of deflection up to 50 mm
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Large range of test loads from 98.1 to 1839N automatic selectable

SIMPLE AND UNIVERSAL

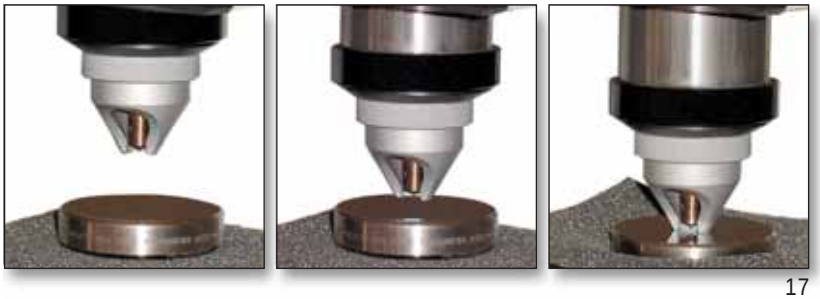
- Easy and quick Rockwell, SuperRockwell, Brinell, Vickers measures in a single machine
- Every environmental condition is tolerable: presence of dust, vibration, changes of temperature
- Wide software functions, information guide and Windows icons
- Immediate conversions
- Statistics and connection to printer with diagrams and graphs

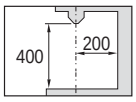
VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular pieces, unfinished pieces, that are raised or misaligned, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support. ①

Optional accessory:
Clamping base for big or unstable pieces

② AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 330 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including Tensile stress R KN/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.1 HRC
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measuring

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Large parts can be tested without any extra accessories*

⑤ *Support base for heavy parts 330x390 mm up to 2000 kg weight (optional)*

⑥ *Support for anvils to lock the pieces or for quick displacements Code 13330 (optional)*

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Mode of operation	Manual
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 400 mm
Mobile clamping	from 0 to 50 mm multiples till 400 mm
Self aligning to test surface	from 0 to 50 mm multiples till 400 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Reading	digital Rockwell+Brinell+R N N/mm²
Reading resolution	0.1 HRC - 0.1 HB
Total height capacity	400 mm (more upon request)
Total depth capacity	200 mm
Base	330x390 mm with T slots
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

For more information refer to catalogue 01.01-330 RSD

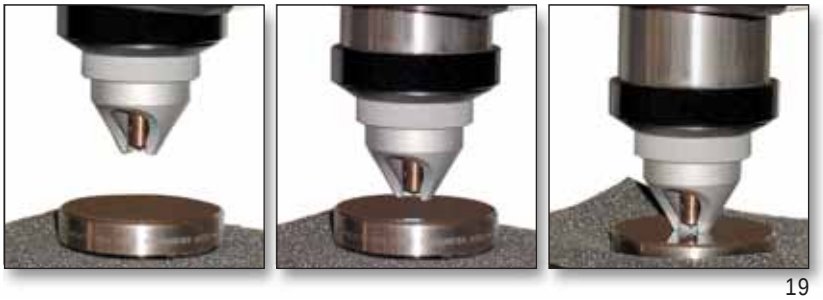
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑦

- Following initiation by operating the Start lever, the 330 RSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ④ ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

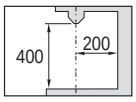
UNLIMITED CONDITIONS OF USE

- Every environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

⑦ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 330 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  TThe instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including resistance to tensile stress R KN/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.1 HRN
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measurement

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Support for anvils to lock the pieces or for quick displacements*
Code 13330 (optional)

⑤ *Support base for heavy parts 330x390 mm up to 2000 kg weight (optional)*

⑥

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms to standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell sup. HRN+HRT Brinell HB 30; HB 5; HB 2.5
Mode of operation	Manual
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 400 mm
Mobile clamping	from 0 to 50 mm multiples till 400 mm
Self aligning to test surface	from 0 to 50 mm multiples till 400 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Reading	digital Rockwell superficial
Reading resolution	0.1 HRN
Total height capacity	400 mm (more upon request)
Total depth capacity	200 mm
Base	330x390 mm with T slots
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Power supply	220V 50÷60Hz - 200VA
Fields of application	Nitriding, cementation, hardened face with depth less than 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-330 RSD

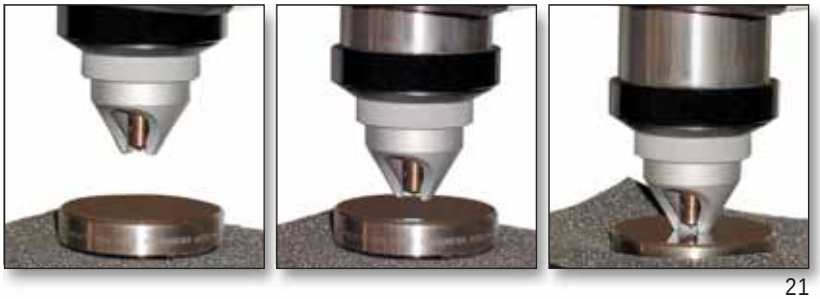
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑦

- Following initiation by operating the Start lever, the 330 SD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ④ ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

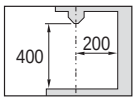
UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

⑦ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 330 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.5 HRC
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measuring
- Automatic advancing and return of the measuring head over 50 mm

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Support for anvils to lock the pieces or for quick displacements*
Code 13330 (optional)

⑤ *Support base for heavy parts 330x390 mm up to 2000 kg weight (optional)*

⑥

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 400 mm
Mobile clamping	from 0 to 50 mm multiples till 400 mm
Self aligning to test surface	from 0 to 50 mm multiples till 400 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HRC
Total height capacity	400 mm (more upon request)
Total depth capacity	200 mm
Base	330x390 mm with T slots
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-330 RSD

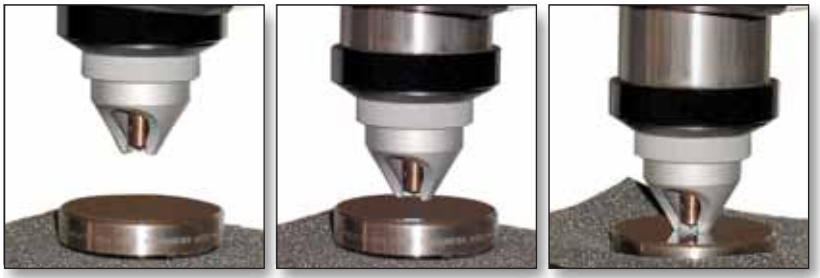
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE⑦

- Following initiation by operating the Start lever, the 330 RS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ④ ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

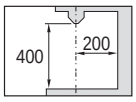
UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

⑦ AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



SYSTEM AFFRI®



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

Using the new AFFR® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 330 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly, have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.5 HRN
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measuring
- Automatic advancing and return of the measuring head over 50 mm

⑥

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Support for anvils to lock the pieces or for quick displacements*
Code 13330 (optional)

⑤ *Support base for heavy parts 330x390 mm up to 2000 kg weight (optional)*

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell sup. HRN+HRT Brinell Vickers
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 400 mm
Mobile clamping	from 0 to 50 mm multiples till 400 mm
Self aligning to test surface	from 0 to 50 mm multiples till 400 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HRN
Total height capacity	400 mm (more upon request)
Total depth capacity	200 mm
Base	330x390 mm with T slots
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-330 RSD

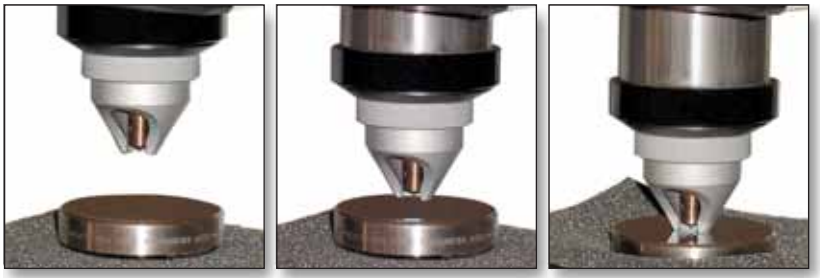
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑦

- Following initiation by operating the Start lever, the 330 S head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ④ ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

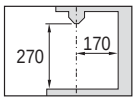
UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

⑦ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including tensile strength R Kg N/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.1 HRC
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measurement

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Support for anvils to lock the pieces or for quick displacements*
Code 13330 (optional)

⑤ *Support base for heavy parts 270x330 mm up to 2000 kg weight (optional)*

⑥

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Mode of operation	manual
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Reading	digital Rockwell+Rockwell+Break N/mm²
Reading resolution	0.1 HRC
Total height capacity	270 mm
Total depth capacity	170 mm
Base	270x330 mm
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	80 Kg
Packing weight	90 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-330 RSD

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑦

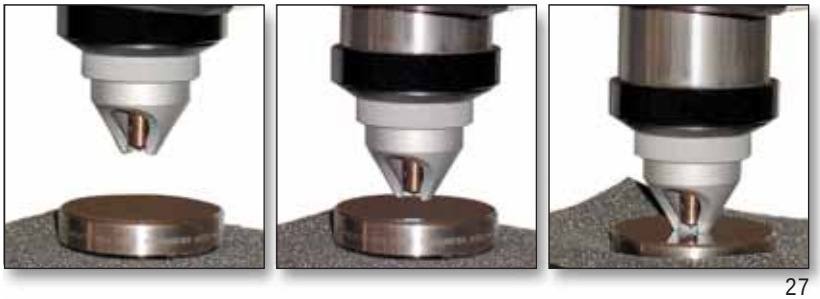
- Following initiation by operating the Start lever, the 270 RSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ④ ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

UNLIMITED CONDITION OF USE

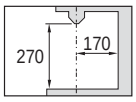
- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

Optional base 270x330

⑦ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including resistance to tensile strength R Kg. N/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.1 HR
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measurement

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Support for anvils to lock the pieces or for quick displacements*
Code 13330 (optional)

⑤ *Support base for heavy parts 270x330 mm up to 2000 kg weight (optional)*

⑥

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell sup. HRN+HRT Brinell HB 30; HB 5; HB 2.5
Mode of operation	manual
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Digital reading	Superficial Rockwell
Reading resolution	0.1 HRN
Total height capacity	270 mm
Total depth capacity	170 mm
Base	270x330 mm
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Power supply	220V 50÷60Hz - 200VA
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	80 Kg
Packing weight	90 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-330 RSD

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑦

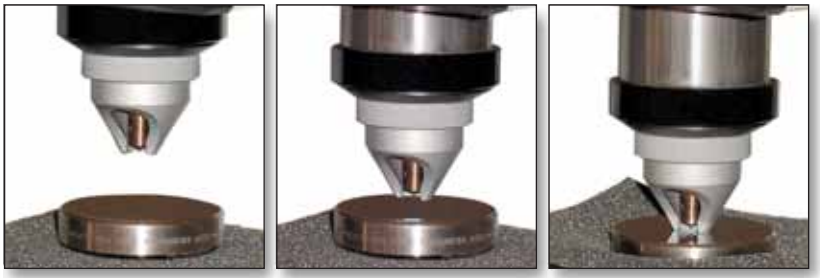
- Following initiation by operating the Start lever, the 270 RSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ①
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested④ ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

UNLIMITED CONDITION OF USE

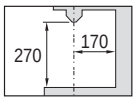
- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

Optional base 270x330

⑦ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly, have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.5 HRC
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measuring
- Automatic advancing and return of the measuring head over 50 mm

⑥

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Support for anvils to lock the pieces or for quick displacements*
Code 13330 (optional)

⑤ *Support base for heavy parts 330x390 mm up to 2000 kg weight (optional)*

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HRC
Total height capacity	270 mm
Total depth capacity	170 mm
Base	270x330 mm with T slots
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	80 Kg
Packing weight	90 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-330 RSD

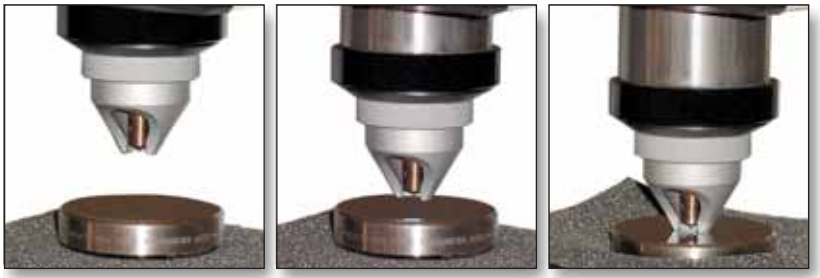
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑦

- Following initiation by operating the Start lever, the 270 RS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ② ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface ② ⑥
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

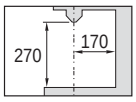
UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

⑦ AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



SYSTEM AFFRI®



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50 mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly, have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.5 HRN
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measuring
- Automatic advancing and return of the measuring head over 50 mm

⑥

①

②

④ *Supporting accessories for special requirements*
13601 H=100 mm
13602 H=50 mm

③ *Support for anvils to lock the pieces or for quick displacements*
Code 13330 (optional)

⑤ *Support base for heavy parts 330x390 mm up to 2000 kg weight (optional)*

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell sup. HRN+HRT Brinell Vickers
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HRN
Total height capacity	270 mm
Total depth capacity	170 mm
Base	270x330 mm with T slots
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	80 Kg
Packing weight	90 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-330 RSD

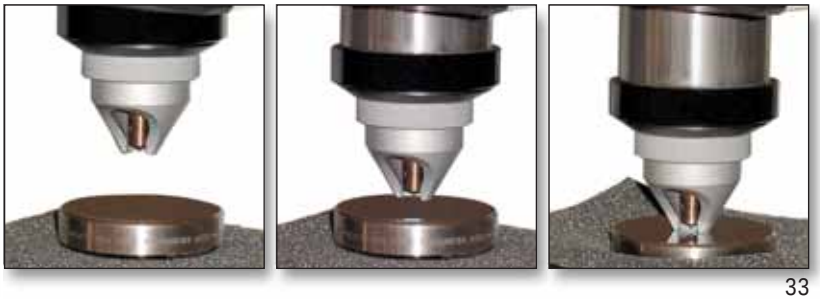
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ⑦

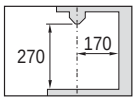
- Following initiation by operating the Start lever, the 270 S head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Large fixed base 330x390 mm for sturdy and stable support of test pieces. Small and large size components up to 2000 Kg weight can be tested ② ⑤
- Accessories can be applied on the table to facilitate the positioning of irregular test pieces ③ ④ ⑥
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time
- The head moves down automatically into contact and executes the test cycle
- Automatic clamping of test piece surface ② ⑥
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

⑦ AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50 mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

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ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including tensile strength R Kg. N/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.1 HRC
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measurement

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	digital Rockwell+Brinell+R N/mm²
Reading resolution	0.1 HRC
Total height capacity	270 mm
Total depth capacity	170 mm
Front base area	120x120 mm
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-331 RSD

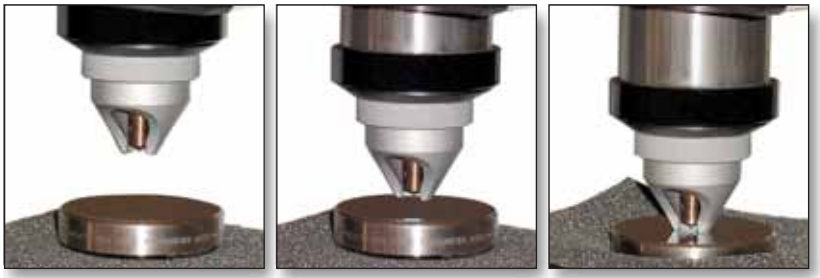
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

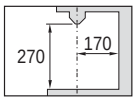
- Following initiation by operating the Start lever, the 270 RSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Slim fixed base permits easy measurement outside rings: impossible with conventional hardness testers ③
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time ①
- The head moves down automatically into contact and executes the test cycle ④
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

④ AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





AUTOMATIC ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50 mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

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ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including tensile strength R Kg N/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.1 HRN
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measurement

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests	Rockwell sup. HRN+HRT Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	digital Superficial Rockwell+Brinell+R N/mm²
Reading resolution	0.1 HRN
Total height capacity	270 mm
Total depth capacity	170 mm
Front base area	120x120 mm
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-331 RSD

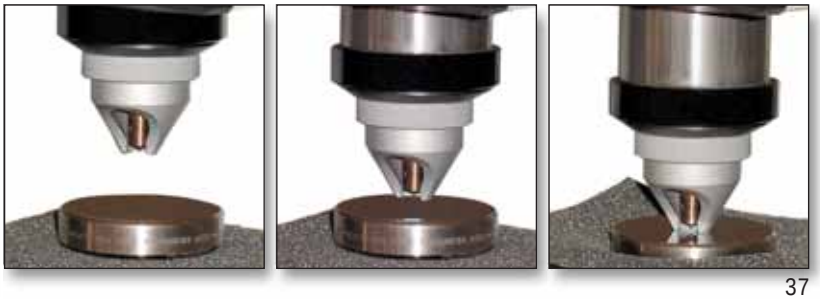
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

- Following initiation by operating the Start lever, the 331 SD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Slim fixed base permits easy measurement outside ring: impossible with conventional hardness testers ③
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time ①
- The head moves down automatically into contact and executes the test cycle ④
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

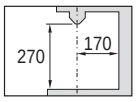
UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

④ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50 mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.1 HRC
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measuring
- Automatic advancing and return of the measuring head over 50 mm

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Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HRC
Total height capacity	270 mm
Total depth capacity	170 mm
Front base area	120x120 mm
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-331 RSD

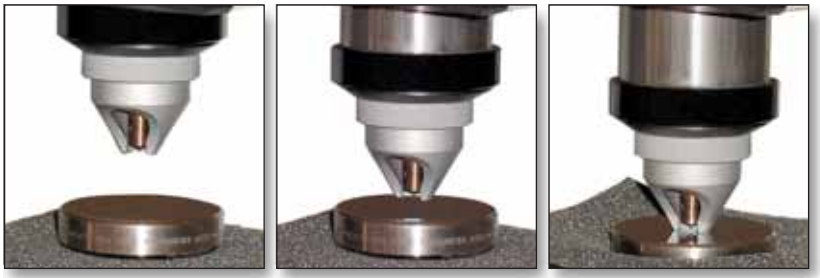
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

- Following initiation by operating the Start lever, the 331 RS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Slim fixed base permits easy measurement outside rings: impossible with conventional hardness testers ③
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time ①
- The head moves down automatically into contact and executes the test cycle ④
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

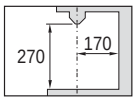
UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

④ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50 mm , to 270 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly, have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

PERFORMANCE AT THE HIGHEST TECHNOLOGICAL LEVEL

- Ease of use: single initiation
- Division 0.5 HRN
- Rapid testing: no break or pause during the test sequence (unprecedented technology)
- Absolute hardness measuring
- Automatic advancing and return of the measuring head over 50 mm

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Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell sup. HRN+HRT Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm multiples till 270 mm
Mobile clamping	from 0 to 50 mm multiples till 270 mm
Self aligning to test surface	from 0 to 50 mm multiples till 270 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HRN
Total height capacity	270 mm
Total depth capacity	170 mm
Front base area	120x120 mm
Max load of test piece	2000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	100 Kg
Packing weight	110 Kg
Packing measurements	54x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-331 RSD

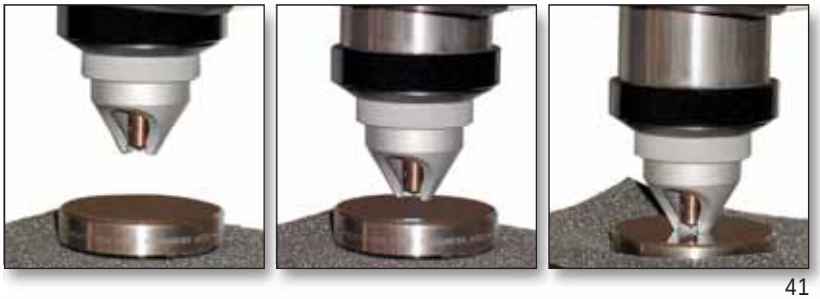
SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

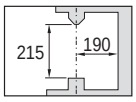
- Following initiation by operating the Start lever, the 331 S head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ②
- Automatic compensation of deflection up to 50 mm
- Slim fixed base permits easy measurement outside ring: impossible with conventional hardness testers ③
- The long stroke head permits easy tests on different height components without the need to change the elevating screw position every time ①
- The head moves down automatically into contact and executes the test cycle ④
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

UNLIMITED CONDITION OF USE

- Any environmental condition is tolerable: presence of dust, vibrations, sudden changes of temperature
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

④ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**





Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50 mm , to 215 mm (or higher on request).

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

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ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including tensile strength R Kg N/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

CERTIFICATION

- Supplied with certificates on SIT primary samples

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm
Mobile clamping	from 0 to 50 mm
Self aligning to test surface	from 0 to 50 mm
Automatic compensation of deflection piece	from 0 to 50 mm
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Reading resolution	0.1 HRC
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Self clamping	200 ÷ 4000 N
Piece selection transmission	included
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	68 kg
Packing weight	88 kg
Packing measurements	34x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-206 RSD

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

- Following initiation by operating the Start lever, the 206 RSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ③
- Automatic compensation of deflection up to 50 mm
- A set of anvils facilitates the positioning of round and flat samples
- The head goes down automatically to contact and execute test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

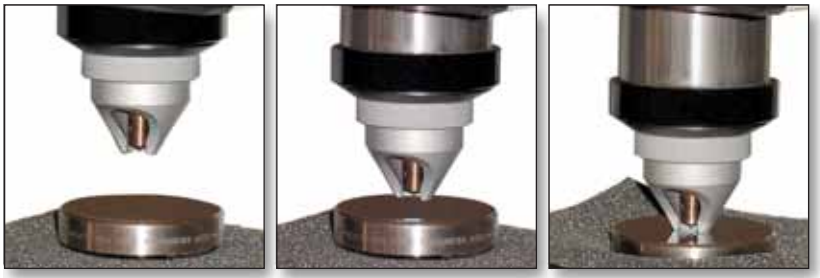
AUTOMATIC

- Automatic load application and selection
- Rapid sequence following indenter contact
- High definition (0.1 HRC)
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.

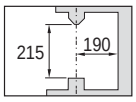
SIMPLE AND UNIVERSAL

- High precision and rapidity of measurement
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Immediate conversion
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagram, graph, tests list, average, standard deviation.

④ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL



Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 215 mm (or higher on request). ① ②

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

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ELECTRONIC MANAGEMENT OF TEST CYCLE

- Measuring data setting via keyboard
- Rockwell and Brinell scale selection with direct digital readout
- Possibility of immediate conversion of the result into other scales including tensile strength R Kg N/mm²
- Test time from 0.1 to 99.9 seconds
- Upper and lower tolerance limits for segregation of parts in production
- Automatic check of test cycle with auto-diagnosis and signals during the measuring phase
- Automatic raise and lower of the measuring head over 50 mm travel
- RS 232 C Data transmission for output to a printer or computer
- Possibility to obtain average and statistics of results with diagram

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

CERTIFICATION

- Supplied with certificates on SIT primary samples

Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell sup. HRN + HRT Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm
Mobile clamping	from 0 to 50 mm
Self aligning to test surface	from 0 to 50 mm
Automatic compensation of deflection piece	from 0 to 50 mm
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Digital reading	Superficial Rockwell
Reading resolution	0.1HR N
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Self clamping	200 ÷ 4000 N
Piece selection transmission	included
Power supply	220V 50÷60Hz - 200VA
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	68 kg
Packing weight	88 kg
Packing measurements	34x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-206 RSD

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

- Following initiation by operating the Start lever, the 206 SD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments
- Perfect and effective measurements including the first test
- Insensitive to deflections ③
- Automatic compensation of deflection up to 50 mm
- A set of anvils facilitates the positioning of round and flat samples
- The head goes down automatically to contact and execute test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

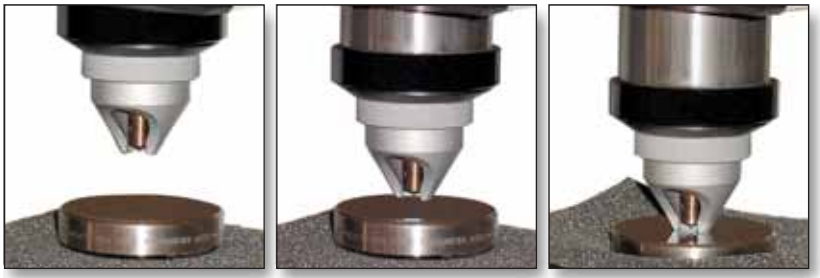
AUTOMATIC

- Automatic load application and selection
- Rapid sequence following indenter contact
- High definition (0.1 HRN)
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.

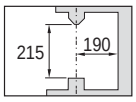
SIMPLE AND UNIVERSAL

- High precision and rapidity of measurement
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environment.
- Immediate conversion
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagram, graph, tests list, average, standard deviation.

④ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC ROCKWELL - BRINELL

Using the new AFFRI® system, the test piece is placed in the machine operating area, selected according to the piece size: its height can range from 50 mm minimum in multiples of 50mm , to 215 mm (or higher on request). ① ②

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly,have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.
- Automatic advancing and return of the measuring head for 50 mm

CERTIFICATION

- Supplied with certificates on SIT primary samples

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Technical characteristics

Preload	(10 Kgf) 98.07 N
Test loads	(60-100-150 kgf) Rockwell 588-980-1471 N (10-60-100 kgf) Vickers 98.07-588-980 N (62.5-125-187.5 kgf) Brinell 612-1225-1839 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell HRC A D B F G L M R Brinell HB 30; HB 10; HB 5; Break N/mm²
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm
Mobile clamping	from 0 to 50 mm
Self aligning to test surface	from 0 to 50 mm
Automatic compensation of deflection piece	from 0 to 50 mm
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HR
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	For all metals: iron, steel, tempered steel, cast iron, brass, aluminium, copper, metal alloys, hard and soft plastics with a higher thickness than 0.6 mm
Net weight	68 kg
Packing weight	88 kg
Packing measurements	34x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell C indenter
- Rockwell B indenter
- Rockwell test blocks C-B

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 2.5 - 5 mm
- Brinell test block for ball 2.5 - 5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-206 RSD

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

- Following initiation by operating the Start lever, the 206 RS head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments

ABSOLUTE PRECISION

- Perfect and effective measurements including the first test
- Insensitive to deflections ③
- Automatic compensation of deflection up to 50 mm
- A set of anvils facilitates the positioning of round and flat sample.
- The head goes down automatically to self contact and execute test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 98.1 to 1839N)

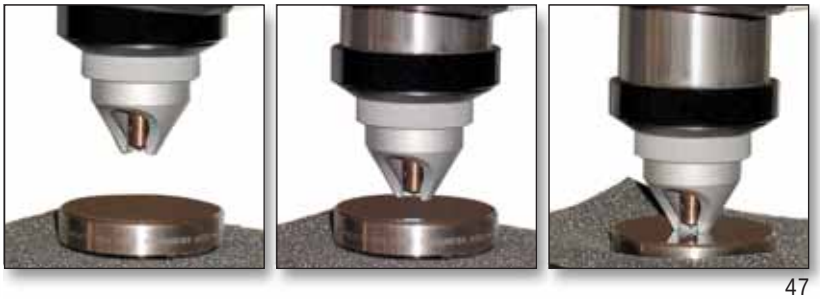
AUTOMATIC

- Automatic load application and selection
- Rapid sequence following indenter contact
- High definition (0.5 HRC).

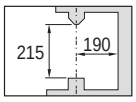
SIMPLE AND UNIVERSAL

- High precision and rapidity of measurement
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.

④ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI®



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

With the new AFFRI® system, you place the testing piece in the machine operating area; this area can be selected according to the piece size: its height can range from 50 mm minimum or multiples of 50, to 215 mm or higher on demand. ① ②

- **High working speed:** the test cycle duration conforms to international standards and can be set by the operator. High accuracy of results, reproducibility and repeatability, the reference point working autonomy implies that all alterations (adjustments, deformations, impurities on test blocks and supports), present in the area above or below the reference point, have no influence on the test. The mechanical and physical characteristics of the supports ,similarly, have no influence on the measurement accuracy.
- **Absolute measurements in every condition.**
  Test after test, the loading is **precise, repeatable and can be reproduced.**
  The instrument meets all ASTM EN ISO requirements. Its use is advantageous in laboratories and in manufacturing for total and continuous monitoring of production in its different stages, leading to great improvement in quality control during manufacturing of components such as bearings, car parts and safety-critical aeronautical materials.

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.
- Automatic advancing and return of the measuring head for 50 mm

CERTIFICATION

- Supplied with certificates on SIT primary samples

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Technical characteristics

Preload	(3 Kgf) 29.4 N
Test loads	(15-30-45 kgf) Rockwell 147-294-441 N (3-15-30 kgf) Vickers 29-147-294 N (15.6-31.2 kgf) Brinell 153-306 N
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Feasible tests Twin	Rockwell sup. HRN + HRT Brinell HB 30; HB 5; HB 2.5
Action	Only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase: approach to the piece; clamping of the piece; activation of reference surface; entire test cycle performance and release of piece.
Mobile Indenter	from 0 to 50 mm
Mobile clamping	from 0 to 50 mm
Self aligning to test surface	from 0 to 50 mm
Automatic compensation of deflection piece from 0 to 50 mm	
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Read out	analogic automatic zeroing
Reading resolution	0.5 HR
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Self clamping	200 ÷ 4000 N
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	68 kg
Packing weight	88 kg
Packing measurements	34x54x99 cm

Applicable accessories

Standard
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Hardness conversion table
- Wooden case with accessories
- Dust cover
- Power cord
- User manual

Rockwell
- Rockwell N indenter
- Rockwell T indenter
- Rockwell test blocks N-T

On request
- Printer
- Table to support hardness tester

Brinell
- Ball penetrator 1 - 2.5 mm
- Brinell test block for ball 1 - 2.5 mm

Vickers
- Vickers 136° indenter
- Vickers test blocks

CE

For more information refer to catalogue 01.01-206 RSD

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ④

- Pushing the Start lever, 206 S head moves down to take contact the test surface from distance multiples of 50 mm and automatically starts the hardness test cycle in automatic succession without breaking a phase:
  - approach to the piece;
  - clamping of the piece;
  - activation of reference surface;
  - entire test cycle performance and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments

ABSOLUTE PRECISION

- Perfect and effective measurement even at the first test
- Insensitive to deflections ③
- Automatic compensation of deflection up to 50 mm
- A set of anvils facilitates the positioning of round and flat sample.
- The head goes down automatically to self contact and execute test cycle
- Automatic clamping of test piece surface
- High R. & R. better than8%
- Large range of test loads (from 29.4 to 441N)

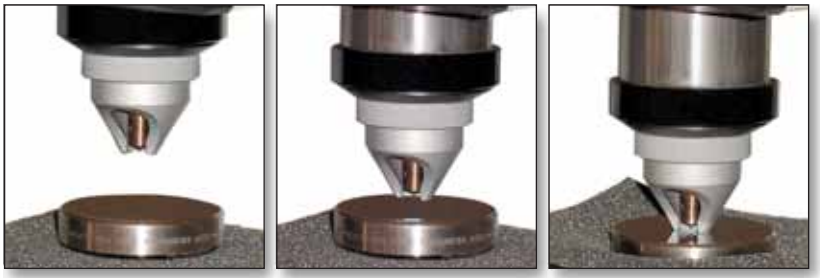
AUTOMATIC

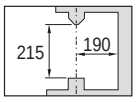
- Automatic load application and selection
- Rapid sequence following indenter contact
- High definition (0.5 HRN)

SIMPLE AND UNIVERSAL

- High precision and rapidity of measurement
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.

④ **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**





AUTOMATIC ROCKWELL - SUPER ROCKWELL - BRINELL - VICKERS

- **High resolution 0.1 HRC 0.01 available on request**
- Closed-loop load control (AFFRI® patent)
- Load and indenter penetration on the same axis in order to obtain an absolute hardness measurement
- High precision rapid measurement
- High resolution (0.1 HRC)
- **Unparalleled Accuracy, Repeatability and Reproducibility** under all test conditions which can be verified under operational conditions R. & R. within 8%
- Graphical illuminated display to obtain clear and accurate readings. Icons facilitate operator identification of software functions.
- Signal of test cycle end to aid the operator
- Single button operator selection of test load and measurement scale
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers and N/mm^2).
- **Programmed closed-loop selection and control of pre-loads/ main loads** using a load cell (AFFRI® patent)
- Effective statistics software incorporated with printer or computer connection for: diagram, graph, tests summary, average, standard deviation.
- The instrument and its controls are ergonomically provided with security devices according to CE norms
- Software includes settings in three selectable classes to facilitate integration of the instrument into automatic lines
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and storage of results

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.
- Every environmental condition is tolerated: presence of dust, vibrations, changes of temperature

WARRANTY

- **Two years full warranty** in order to assure high technological level it contains
- Wide range of accessories in order to hold pieces of every shape

Technical characteristics

Preload	(10 Kgf) 98.07 N - (3 Kgf) 29.4 N
Vickers Knoop loads	(3 5 10 15 20 30 60 100 Kgf) 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N
Mode of operation	automatic with load cell and closed loop Affri patent
Feasible tests Twin	Rockwell HRC A D B F G L M R Superficial Rockwell HRN+HRT Brinell HB 30, HB 10, HB 5, HB 2.5; Break N/mm^2 Vickers (3 5 10 20 30 50 100 Kgf) 29.43 49.05 98.10 196.20 294.30 490.50 981 N only indentation
Digital reading	Rockwell - Brinell - Vickers - Resolution: 0.1 HR - 0.1HB - 0.1 HV (0.01 HR unit, on request)
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Total height capacity	215 mm
Total depth capacity	190 mm
Max load of test piece	1000 Kg
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Fields of application	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing
Net weight	75 Kg
Packing weight	90 Kg
Packing measurements	37x60x100 cm

Applicable accessories

Standard

1 HRC diamond indenter
1 HRB ball indenter Ø 1/16”
1 HRC-N test block
1 HRB-T test block
1 V flat anvil 60 mm diameter
1 flat anvil 60 mm diameter
1 double face spot anvil v and flat 25 mm diameter
1 Wooden case with tools
1 Test certificate and warranty
1 Tables for hardness conversion
1 Dust cover

on request

- Brinell hard metal ball indenter Ø 1 - 2.5 - 5 mm
- Brinell hard metal ball indenter Ø 1/2”-1/4”-1/8” for plastics
- Brinell test block
- Vickers diamond 136° indenter
- Vickers test block
- Microscope with illumination
- 80 column printer with input RS 232 C
- Computer for data processing
- Customised programs for measurement results can be supplied
- Clamping of piece

For more information refer to catalogue 01.01-250 DRMC

SIMPLE AND UNIVERSAL

- Ample software functions, information guide and Windows icons
- Brinell, Vickers, Rockwell measurements
- Rapid operation following indentor contact

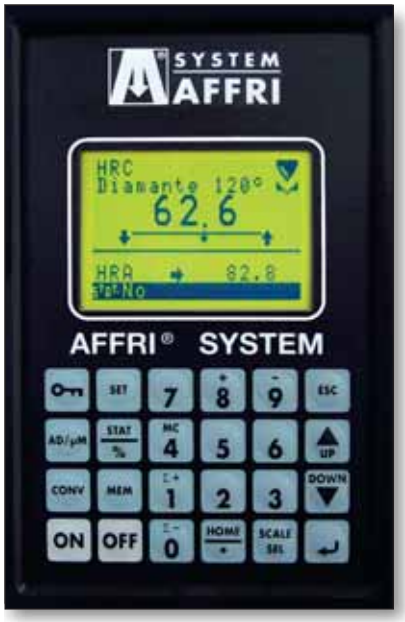
MOTORISED

- Single initiation of fully automatic operation
- Automatic load application and selection
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Operates test on wood tables in accordance with PN EN 1534/94

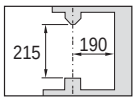
CERTIFICATION

- Supplied with certificates on SIT primary samples

Optional accessory:
Clamping base for large or unstable pieces



SYSTEM AFFRI



AUTOMATIC ROCKWELL - BRINELL

- A twin fully motorised Hardness Tester
- Performs Rockwell and Brinell Tests in a single machine
- Executes Rockwell and Brinell tests with accurate test force and specific ball indenter
- The depth detector and electronic calculator automatically measure and the Brinell value is shown on the clear LCD display.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFERS MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations . The hardness tester can operate directly next to the production line giving real time quality control.
- User friendly software permits the storage of results and calculation of average values.The machine can connect to a printer or a PC to transmit stored data.
- A set of anvils permits easy tests on round or flat surfaces
- Customised accessories can be provided to meet special requirements.

SIMPLE OPERATION:

Select load and scale for the correct indenter. Turn the hand wheel to raise the test piece into contact with the indenter and the result will appear automatically.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Technical characteristics

Preload	(10 Kgf) 98.07 N
Test Load	588-980-1471N Rockwell (60-100-150Kgf) 98.07-588N Vickers (10-60Kgf)
Mode of operation	Motorised load application - Electronic control
Feasible Tests Twin	Rockwell: HRA; HRB; HRC; HRD; HRE; HRF; HRG; HRH; HRK Vickers: HV10; HV60; HV100 only indentation *Brinell (on request): HB 2.5/62.5; HB2.5/187.5; HB 5/125 HBT 2.5/62.5; HBT 2.5/187.5; HBT 5/125
Reading resolution	0.1 HR - 0.1 HB
Accuracy	Conforms with standards EN-ISO 6508-2 / 6506-2
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Data output	RS 232 C optional
Power supply	100÷240V 50÷60 Hz 12VA
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6mm, plastics, soft and hard rubber
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 "V" anvil Ø60
1 Flat anvil Ø60
1 Combined spot anvil for small round flat pieces
1 Wooden case
1 Calibration certificate
1 Warranty certificate
1 Hardness conversion table
1 Dust Cover
1 HRC diamond penetrator
1 HRB ball penetrator Ø1/16"
1 HRB test block
1 HRC test block

On request

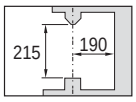
- Printer 20 coloumn with input RS232C
- AFFRI-STAT statistics programs
- Computer for statistics program
- Rocwell ball penetrator WØ1/4" - 1/8" mm
- Vickers penetrator 136°
- Vickers test block
- Microscope1216 Model for Vickers measurements
- Brinell ball penetrator W Ø 5-2.5mm
- Brinell automatic program: HBT 2.5/62.5 - HBT 5/125 - HBT 2.5/18.5
- Brinell test block
- Brinell indenter1mm
- Brinell indenter 2.5mm
- Brinell indenter 5mm
- Large flat anvil 140mmØ
- Data output in RS 232 C
- Special penetrator art. 604 for tests standard interior of tubes

For more information refer to catalogue 03.01-206 MX

- *Motorised*
- *Twin Rockwell - Brinell**
- *Digital Read Out*
- *Automatic start*
- *Statistics and data print out*

Optional printer

SYSTEM AFFRI



AUTOMATIC SUPERFICIAL ROCKWELL - BRINELL

- A twin fully motorised Hardness Tester
- For Super Rockwell tests
- Executes Super Rockwell and Brinell tests on thin material and surface coatings also
- The depth detector and electronic calculator automatically measure and the Brinell value is shown on the clear LCD display.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFERS MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations . The hardness tester can operate directly next to the production line giving real time quality control.
- User friendly software permits the storage of results and calculation of average values.The machine can connect to a printer or a PC to transmit stored data.
- A set of anvils permits easy tests on round or flat surfaces
- Customised accessories can be provided to meet special requirements.

SIMPLE OPERATION:

Select load and scale for the correct indenter. Turn the hand wheel to raise the test piece into contact with the indenter and the result will appear automatically.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Technical characteristics

Preload	29.4N (3 Kgf)
Test Load	147-294-441N Superficial Rockwell (15-30-45Kgf) 29-147-294N Vickers (3-15-30Kgf)
Mode of operation	Motorised load application - Electronic control
Feasible Tests Twin	Superficial Rockwell: HR15N; HR30N; HR45N; HR15T; HR30T; HR45T Vickers: HV3; HV15; Hv30 *Brinell (on request): HB 2.5/15.625; HB 2.5/31.25 HBT 2.5/15.625; HBT 2.5/31.25
Reading resolution	0.2 HR - 0.2 HB
Accuracy	Conforms with standards EN-ISO 6508-2 / 6506-2
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Data output	RS 232 C optional
Power supply	100÷240V 50÷60 Hz 12VA
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 "V" anvil Ø60
1 Flat anvil Ø60
1 Combined spot anvil for small round flat pieces
1 Wooden case
1 Calibration certificate
1 Warranty certificate
1 Hardness conversion table
1 Dust Cover
1 HRN Diamond penetrator
1 HRT ball penetrator Ø1/16"
1 HR30N test block
1 HR30T test block

On request

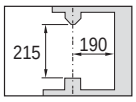
- Printer 20 column with RS232C input
- AFFRI-STATstatistic programs
- Computer for statistic program
- Vickers penetrator 136°
- Vickers test block
- Microscope1216 Model for Vickers measurements
- Brinell ball penetrator W Ø1-5-2.5mm
- Brinell automatic program: HBT 2.5/15, 625 - HBT 2.5/31.25
- Brinell test block
- Brinell indenter1mm
- Brinell indenter 2.5mm
- Large flat anvil 140mmØ
- Data output in RS 232 C
- Special penetrator art. 604 for tests standard insides of tubes

For more information refer to catalogue 03.01-206 MX

- *Motorised*
- *Superficial Rockwell*
- *Digital Read Out*
- *Automatic start*
- *Statistics and data print out*

Optional printer

SYSTEM AFFRI



ROCKWELL - BRINELL

- Hardness Tester for Rockwell Brinell tests
- Performs Rockwell Brinell Tests in a single machine
- The depth detector and electronic calculator automatically measure and the Rockwell or Brinell value is shown on the clear LCD display.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFERS MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations. The hardness tester can operate directly next to the production line giving real time quality control.
- User friendly software permits the storage of results and calculation of average values.The machine can connect to a printer or a PC to transmit stored data.
- A set of anvils permits easy tests on round or flat surfaces
- Customised accessories can be provided to meet special requirements.

SIMPLE OPERATION:

Select load and scale for the correct indenter. Turn the hand wheel to raise the test piece into contact with the indenter and the result will appear automatically.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Optional printer

Technical characteristics

Preload	(10 kgf) 98.07 N
Test loads	(60-100-150kgf) Rockwell 588-980-1471N (10-60-100kgf) Vickers 98.07-588-980N (62.5-125-187.5kgf) Brinell 612-1225-1839N
Mode of operation	manual
Feasible tests Twin	Rockwell: HRA; HRB; HRC; HRD; HRE; HRF; HRG; HRH; HRK Vickers: HV10; HV60; HV100 only indentation *Brinell (on request): HB 2.5/62.5; HB2.5/187.5; HB 5/125 HBT 2.5/62.5; HBT 2.5/187.5; HBT 5/125
Reading resolution	0.1 HR
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of column	60 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6 mm, plastics, soft and hard rubber
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 HRC diamond penetrator
1 HRB ball penetrator Ø 1/16”
1 HRC test block
1 HRB test block
1 Flat anvil 60 mm
1 “V“ anvil 60 mm
1 Combined spot “V” + flat anvil
1 Wooden case
1 Calibration certificate
1 Hardness conversion table
1 Dust cover

on request

- Ball penetrator in hard metal Ø 2.5-5 mm (1/4” - 1/8”) for plastic
- Vickers penetrator
- Brinell test block
- Vickers test block
- Microscope 1216 Model for Vickers measurements
- Printer 80 column with RS 232 C connection
- Computer for statistic program
- Statistic programs
- Large flat anvil 140 mm Ø
- Special penetrator art. 604 for tests standard insides of tubes

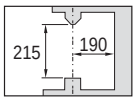
For more information refer to catalogue 01.01-206 RTD

ELECTRONIC MANAGEMENT OF THE MEASUREMENT CYCLE

- Each test phase is followed on the liquid crystal display in digital progression.
- Keyboard setting of the measurement data: choice of Rockwell or Brinell hardness scales.
- Sets out the minimum and maximum tolerance limits
- Test time that can be set out from 1 to 99 seconds.
- Data output via RS 232 C for connection to printer and computer for diagram plotting and statistics.
- Digital reading on all Rockwell and Brinell scales and tensile module conversion.

- ***Twin Rockwell - Brinell***
- ***Digital Read Out***
- ***Data print out***

SYSTEM AFFRI



SUPERFICIAL ROCKWELL - BRINELL

- Hardness Tester for Super Rockwell tests
- Executes Super Rockwell for thin material and surface coatings .
- The depth detector and electronic calculator automatically measure and the SuperRockwell value is shown on the clear LCD display.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFERS MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations . The hardness tester can operate directly next to the production line giving real time quality control.
- User friendly software permits the storage of results and calculation of average values.The machine can connect to a printer or a PC to transmit stored data.
- A set of anvils permits easy tests on round or flat surfaces
- Customised accessories can be provided to meet special requirements.

SIMPLE OPERATION:

Select load and scale for the correct indenter. Turn the hand wheel to raise the test piece into contact with the indenter and the result will appear automatically.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Optional printer

Technical characteristics

Preload	(3 kgf) 29.4 N
Test loads	(15-30-45kgf) Rockwell superficiale 147-294-441N (3-15-30kgf) Vickers 29-147-294N (15.6-31.2kgf) Brinell 153-306N
Mode of operation	manual
Feasible tests Twin	Superficial Rockwell: HR15N; HR30N; HR45N; HR15T; HR30T; HR45T Vickers: HV3; HV15; Hv30 *Brinell (on request): HB 2.5/15.625; HB 2.5/31.25 HBT 2.5/15.625; HBT 2.5/31.25
Reading resolution	0.2 HR
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of column	60 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Fields of application	Nitriding, cementation, hardened face with depth down to 0.6 mm
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 HRN diamond penetrator
1 HRT ball penetrator Ø 1/16"
1 HRN test block
1 HRT test block
1 Flat anvil 60 mm
1 "V" anvil 60 mm
1 Combined spot "V" + flat anvil
1 Wooden case
1 Calibration certificate
1 Hardness conversion table
1 Dust cover

CE

on request

- Ball penetrator in hard metal Ø 1 - 2.5 mm for plastic
- Vickers penetrator
- Brinell test block
- Vickers test block
- Microscope 1216 Model for Vickers measurements
- Printer 80 column with RS 232 C connection
- Computer for statistic program
- Statistic programs
- Large flat anvil 140 mm Ø
- Special penetrator art. 604 for tests standard insides of tubes

For more information refer to catalogue 01.01-206 RTD

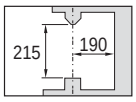
206 RTSD DIGITRONIC

ELECTRONIC MANAGEMENT OF THE MEASUREMENT CYCLE

- Each test phase is followed on the liquid crystal display in digital progression.
- Keyboard setting of the measurement data: choice of superficial Rockwell or Brinell hardness scales.
- Sets out the minimum and maximum tolerance limits
- Test time that can be set from 1 to 99 seconds.
- Data output via RS 232 C for connection to printer and computer for diagram plotting and statistics.
- Digital reading on all Rockwell and Brinell scales and resistance and traction conversion.

- ***Twin Rockwell - Brinell***
- ***Digital Read Out***
- ***Data print out***

SYSTEM AFFRI



ROCKWELL - BRINELL

- A twin Hardness Tester
- Performs Rockwell and Brinell Tests in a single machine
- Executes Rockwell and Brinell tests with real test force and specific ball indenter
- Specific ball indenter.
- The depth detector and electronic calculator automatically measures and the Brinell value is shown on the clear LCD display.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFER MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations . The hardness tester can operate directly next to the production line giving real time quality control.
- User friendly software permits the storage of results and calculation of average values.The machine can connect to a printer or a PC to transmit stored data.
- A set of anvils permits easy tests on round or flat surfaces
- Customised accessories can be provided to meet special requirements.

SIMPLE OPERATION:

Select load and scale for the correct indenter. Turn the hand wheel to raise the test piece into contact with the indenter and the result will appear automatically.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Technical characteristics

Preload	(10 kgf) 98.07 N
Test Load	588-980-1471 N Rockwell (60-100-150 Kgf) 98.07-588 N Vickers (10-60 Kgf)
Mode of operation	Manual
Feasible Tests Twin	Rockwell: HRA; HRB; HRC; HRD; HRE; HRF; HRG; HRH; HRK Vickers: HV10; HV60; HV100 only indentation *Brinell (at your request): HB 2.5/62.5; HB2.5/187.5; HB 5/125 HBT 2.5/62.5; HBT 2.5/187.5; HBT 5/125
Reading	Rockwell 9 scale (HBT on request)
Reading resolution	0.1 HR (0.1 HB)
Accuracy	Conforms with standards EN-ISO 6508-2 / 6506-2
Operation	it can works if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Data output	RS 232C optional
Power supply	100÷240V 50÷60 Hz 12VA
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6mm, plastics, soft and hard rubber
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 "V" anvil Ø60
1 Flat anvil Ø60
1 Wooden case
1 Combined spot anvil for small round and flat pieces
1 Calibration certificate
1 Warranty certificate
1 Hardness conversion table
1 Dust Cover
1 HRC diamond penetrator
1 HRB ball penetrator Ø1/16"
1 HRB test block
1 HRC test block

On request

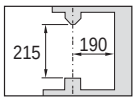
- Printer 20 coloumn with input RS232C
- AFFRI-STAT statistic programs
- Computer for statistic program
- Rocwell ball penetrator WØ1/4" - 1/8"
- Vickers penetrator 136°
- Vickers test block
- Microscope 1216 Model for Vickers/Brinell measures
- Brinell ball penetrator W Ø 5-2.5mm
- Brinell automatic readout: HBT 2.5/62.5 - HBT 5/125 - HBT 2.5/187.5
- Data output in standard RS232C
- Brinell test block
- Brinell indenter 2.5mm
- Brinell indenter 5mm
- Large flat anvil 140mm Ø
- Special penetrator art. 604 for tests standard insides of tubes

For more information refer to catalogue 03.01-206 EX

- *Twin Rockwell - Brinell test**
- *Digital Read Out*
- *Statistics and data print out*

Optional printer

SYSTEM AFFRI



SUPERFICIAL ROCKWELL - BRINELL

- Hardness Tester for Super Rockwell tests
- Executes Super Rockwell for thin material, for surface coatings also.
- The depth detector and electronic calculator automatically measures and the SuperRockwell value is shown on the clear LCD display.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFERS MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations. The hardness tester can operate directly next to the production line giving real time quality control.
- User friendly software permits the storage of results and calculation of average values.The machine can connect to a printer or a PC to transmit stored data.
- A set of anvils permits easy tests on round or flat surfaces
- Customised accessories can be provided to meet special requirements.

SIMPLE OPERATION:

Select load and scale for the correct indenter. Turn the hand wheel to raise the test piece into contact with the indenter and the result will appear automatically.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Technical characteristics

Preload	29,4N (3 Kgf)
Test Load	147 - 294 - 441 N Superficial Rockwell (15-30-45 Kgf) 29 - 147 - 294 N Vickers (3-15-30 Kgf) Superficial Rockwell: HRA; HRB; HRC; HRD; HRE; HRF; HRG; HRH; HRK
Mode of operation	Automatic load timer - Electronic control programmable
Feasible Tests	Superficial Rockwell: HR15N; HR30N; HR45N; HR15T; HR30T; HR45T Vickers: HV3; HV15; HV30 Brinell (upon request): HB 2,5/15,625; HB 2,5/31,25 HBT 2,5/15,625; HBT 2,5/31,25
Reading	6 scale Rockwell (HBT on request)
Reading resolution	0.2 HR
Accuracy	Conforms with standards EN-ISO 6508-2 / 6506-2
Operation	it can works if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Data output	RS 232C optional
Power supply	100÷240V 50÷60 Hz 12VA
Fields of application	Nitriding, cementation, hard facing with depth less to 0.4 mm
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 "V" anvil Ø60
1 Flat anvil Ø60
1 Wooden case
1 Combined spot anvil for small round and flat pieces
1 Calibration certificate
1 Warranty certificate
1 Hardness conversion table
1 Dust Cover
1 HRN Diamond penetrator
1 HRT ball penetrator Ø1/16"
1 HR30N test block
1 HR30T test block

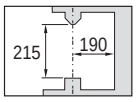
On request

- Printer 20 coloumn with input RS232C
- AFFRI-STAT statistic programs
- Computer for statistic program
- Vickers penetrator 136°
- Vickers test block
- Microscope1216 Model for Vickers/Brinell measures
- Brinell ball penetrator W Ø1-2.5mm
- Brinell automatic readout: HBT 2.5/15, 6.25 - HBT 2.5/31.25
- Data output in standard RS232C
- Brinell test block
- Brinell indenter1mm
- Brinell indenter 2.5mm
- Large flat anvil 140mm Ø
- Special penetrator art. 604 for tests standard insides of tubes

For more information refer to catalogue 03.01-206 EX

- *Superficial Rockwell*
- *Digital Read Out*
- *Statistics and data print out*

Optional printer



ROCKWELL - BRINELL

- It is possible to carry out tests on any parts, even of small dimensions. The visible indenter allows for reaching extreme points for testing tool cutting edges as well.
- The sturdy piece-holder column assures an exact measurement on any detail.
- The internal part is both chromium-plated and ground.
- The bellow guard guarantees constant and safe motion with no need for maintenance.
- It has been designed to obtain the best reliability through time and result accuracy as well.
- Has surpassed severe tests.
- We can supply different pieceholder anvils: from the large plane table to shaped anvils fit for any requirement.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFERS MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations. The hardness tester can operate directly next to the production line giving real time quality control.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Technical characteristics

Preload	(10 kgf) 98.07 N
Test loads	(60-100-150kgf) Rockwell 588-980-1471N (10-60-100kgf) Vickers 98.07-588-980N (62.5-125-187.5kgf) Brinell 612-1225-1839N
Mode of operation	manual
Feasible tests Twin	Rockwell HRC A-D-B-F-G-L-M-R Brinell HB 30; HB 10; HB 5 (on request)
Reading resolution	0.5 HR
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of column	60 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Fields of application	For all metals, steel, hard steel, cast iron, brass, aluminium over 0.6 mm, plastics, soft and hard rubber
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 HRC diamond penetrator
1 HRB ball penetrator Ø 1/16”
1 HRC test block
1 HRB test block
1 Flat anvil
1 “V“ anvil
1 Combined spot “V” + flat anvil
1 Wooden case
1 Calibration certificate
1 Hardness conversion table
1 Dust cover

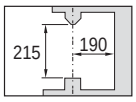
on request

- Ball penetrator in hard metal Ø 2.5-5 mm (1/4” - 1/8”) for plastic
- Vickers penetrator
- Brinell test block
- Vickers test block
- Microscope 1216 Model for Vickers measurements
- Large flat anvil 140 mm Ø
- Special penetrator art. 604 for tests standard insides of tubes

For more information refer to catalogue 01.01-206 RT

- The loads can be selected by a rotary knob and scale on the indenter axis
- Permits Rockwell and Brinell tests and Vickers impressions
- The operating principle is the classic Rockwell principle with direct Rockwell hardness on a large dial
- Brinell hardness is also obtained directly with application of a graduated dial, or use of conversion tables
- By the use of Rockwell scales the pointer dial shows the accurate Rockwell result directly. Brinell scales can easily be put over the dial
- Preloading takes place by the contact of the piece with the indenter
- The scales zero setting is obtained by rotating the dial
- The proof load is applied to the indenter by the control lever
- The hardness value is shown directly on the dial

• *Twin Rockwell - Brinell*



SUPERFICIAL ROCKWELL - BRINELL

- It is possible to carry out tests on any parts, even of small dimensions, on thin material or surface coatings.
  The visible indenter allows access to extreme points for testing tool cutting edges.
- The sturdy piece-holder column assures an exact measurement on any detail.
- The internal part is both chromium-plated and ground.
- The bellow guard guarantees constant and safe motion with no need for maintenance.
- It has been designed to give reliability over time and accuracate results.
- Has surpassed severe tests.
- We can supply different pieceholder anvils: from the large plane table to shaped anvils suitable for any application.

ADVANCED AFFRI TECHNOLOGY INSIDE OFFERS MODERN SOLUTIONS

- The force is created by a dynamometer without requiring oil, shock absorbers and without dead weights as in the obsolete systems of many competitors.
- The AFFRI Dynamometer System permits the operator to use the machine with highly accurate results and repeatability even if the machine is not level, inclined or is subject to vibrations . The hardness tester can operate directly next to the production line giving real time quality control.

Accurate test even on unstable areas

Applying C shape indenter Art. 604, difficult points such as: insides of tubes and near hollows can be reached.

Optional:
1216 Microscope
For Brinell and Vickers indentation measuring

Technical characteristics

Preload	(3 kgf) 29.4 N
Test loads	(15-30-45kgf) Rockwell superficial 147-294-441N (3-15-30kgf) Vickers 29-147-294N (15.6-31.2kgf) Brinell 153-306N
Mode of operation	manual
Feasible tests Twin	Rockwell sup. HRN + HRT Brinell HB 30; HB 5; HB 2.5 - HV - 3 - HV - 15 (on request)
Reading resolution	0.5 HR
Accuracy	Conforms with standards EN-ISO 6506-2 / 6507-2 / 6508-2 / ASTM-E18
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Height capacity	215 mm
Depth capacity	190 mm
Diameter of column	60 mm
Diameter of anvil	60 mm
Max load of test piece	1000 Kg
Fields of application	Nitriding, cementation, hardened face with depth above 0.4 mm
Net weight	65 kg
Packing weight	85 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard

1 HRN diamond penetrator
1 HRT ball penetrator Ø 1/16”
1 HRN test block
1 HRT test block
1 Flat anvil
1 “V“ anvil
1 Combined spot “V” + flat anvil
1 Wooden case
1 Calibration certificate
1 Hardness conversion table
1 Dust cover

on request

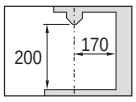
- Ball penetrator in hard metal Ø 1-2.5 mm
- Vickers penetrator
- Brinell test block
- Vickers test block
- Microscope Model for Vickers measurements
- Large flat anvil 140 mm Ø
- Special penetrator art. 604 for tests standard insides of tubes

For more information refer to catalogue 01.01-206 RT

206 RTS

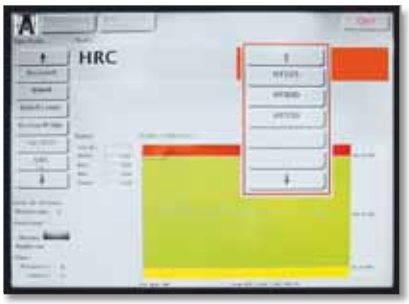
- The loads can be selected by a rotary knob and scale on the indenter axis
- Permits Rockwell and Brinell tests and Vickers impressions
- The operating principle is the classic Rockwell principle with direct Rockwell hardness on a large dial
- Brinell hardness is also obtained directly with application of a graduated dial, or by using conversion tables
- By the use of Rockwell scales the pointer dial shows the accurate Rockwell result directly. Brinell scales can easily be put over the dial
- Preloading is initiated by the contact of the piece with the indenter
- The scale's zero setting is obtained by rotating the dial
- The proof load is applied to the indenter by the control lever
- The hardness value is shown directly on the dial

Twin Rockwell - Brinell



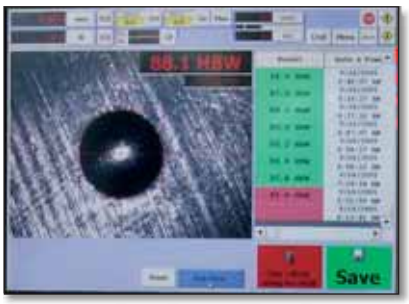
UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

- Fully Automatic Universal Hardness Tester
- Automatic Brinell, Vickers and Rockwell measurements due to the Affri system Closed loop technology inside making the Autofocus for Vickers and Brinell both easy and automatic
- It is a non destructive test, automatically measuring the case depth of a heat treated surface from 0.15 to 1.5 mm thickness directly without cutting the sample in HDTL mode.
- Colour touch screen TFT 17" 180° tilt with scrolling menu.
- Large base for heavy parts 400 x 400 mm
- Sliding indenter stroke from 500 to 0 mm auto contact with test surface
- Automatic clamping for Rockwell tests (Brinell on request)
- One single start input to activate without interruption the complete automatic test sequence: (contact , load and unload ,auto switching of indenter and optics,auto focus,automatic measurement of hardness depth and release of sample),all without cutting the sample. Simple to use.
- Insensitive to sources of external vibrations
- Insensitive to deflections during test cycle
- Insensitive to change of temperature (5 to + 50°C)
- It can be operative also if is not levelled or if inclined

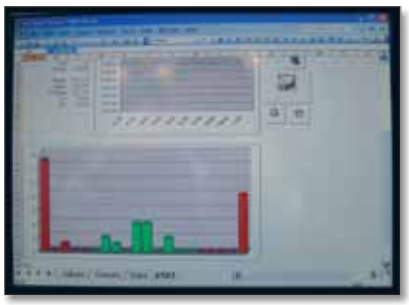


Measurement of hardness case depth treatment without cutting the sample ④

Scrolling menu on touch screen for easy and simple use



Automatic Brinell / Vickers and Auto Focus



Complete with statistics and histogram. Customized text

Available models - Others on request

- **INTEGRAL 1 (loads from 15.6 to 3000) Brinell**
  Brinell 15.6 31.2 62.5 125 187.5 250 500 750 1000 3000.
- **INTEGRAL 2 (loads from 1 to 250) Rockwell+Brinell + Vickers + Shore**
  Brinell 1 5 10 15 15.6 30 31.2 62.5 125 187.5 250, Vickers 1 2 3 5 10 15 30 50 60 100
  Rockwell 15N/T 30N/T 45N/T 60 100 150 HRC A D B F G L M R S T V X Z
  ISO 2039 tests for plastic
- **INTEGRAL 3 (loads from 3 to 1000) Brinell + Vickers + Rockwell +Superficial Rockwell + Case depth**
  Brinell: 3 5 10 15.5 31.2 62.5 125 187.5 250 500 1000; Vickers: 3 5 10 15 30 60 100 120
  Rockwell: 60 100 150; Superficial Rockwell: 15 30 45
  HDTL case depth automatic HV 525 - 550 – 600 (at request)
- **INTEGRAL 4 (loads from 1 to 50) Brinell + Vickers + Shore**
  Brinell 1 5 10 30 31.2 50, Vickers 1 2 3 5 10 15 30 50, Rockwell 15N/T 30N/T 45N/T
  ISO 2039 tests for plastic
- **INTEGRAL 5 (loads from 10 to 3000) Rockwell + Brinell + Vickers**
  Brinell 10 30 31.2 62.5 125 187.5 250 500 750 1000 3000
  Vickers 10 15 30 50 60 100 120, Rockwell 60 100 150 HRC A D B F G L M R S T V X Z
  HDTL case depth test
- **INTEGRAL 6 (loads from 0.3 to 30) Micro Vickers + Superficial Rockwell + Brinell**
  Micro Vickers 0.3 0.5 1 2 5 10 20 30, Brinell 1 5 10 30 31.2, Superficial Rockwell 15 30 45

Range of tests

Brinell	Vickers	Knoop	Rockwell	Shore
HB 1/2.5	HV 1	HK 1	HR 15N	A
HB 1/5	HV 2	HK 2	HR 30N	B
HB 1/10	HV 3	HK 3	HR 45N	C
HB 1/30	HV 5	HK 5	HR 15T W	D
HB 2.5/15.62	HV 10	HK 10	HR 30T W	
HB 2.5/31.2	HV 20	HK 20	HR 45T W	
HB 2.5/62.5	HV 30	HK 30	HR A	
HB 2.5/187.5	HV 50	HK 50	HR B	
HB 5/62.5	HV 100	HK 100	HR C	
HB 5/125	HV 120		HR D	
HB 10/250	(for synthetic material)		HR E	
HB 5/250	HV 49.03N		HR F	
HB 5/750	HV 132.39N		HR G	
HB 10/500	HV 357.9N		HR H	
HB 10/1000	HV 961.0N		HR K	
HB 10/3000			HR L	
			HR M	
			HR alfa	

Technical characteristics

Measures	Automatic Brinell, Vickers, Rockwell and case depth treatment (depending on the model)		
Focus	Automatic		
HDTL function	Permits checking the case depth of hardness treatment from 0.15 to 1.5 mm at 525 - 550 - 600 HV1		
Test height	max 500 min 50 mm self adjusting according to the test start entry		
Depth	170 mm (others on request)		
Action	A single initiation lowers the head and indenter into auto contact with the test surface auto load ,unload ,auto selection of indenter and optics, auto focus and measurement ,auto retraction to free sample		
Load forces	controlled by internal load cell and closed loop system (Affri patent)		
Automatic self switching turret: 1 indenter + 1 objective (optional 5 steps 3 indenters + 2 objectives)			
Resolution	0.1 unit (0.01 mm case depth)		
Net work	Internet connection for technical assistance and auto diagnosis		
Accuracy: Conforms with standards	Brinell EN-ISO 6506-2 Vickers EN-ISO 6507-2	Rockwell EN-ISO 6508-2 Knoop	Plastic DIN EN 53456, EN-ISO 2039-2
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy		
Temperature range	+ 5° to + 50° C		
Self aligning to test surface: from 0 to 500 mm			
Max. weight allowed for the specimen to be tested: 2000 Kg			
Base	400x400 mm		
Fields of application	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hardened face, plastic		
Size	600x1000x1800h		
Net weight	500 Kg		
Packing weight	600 Kg		
Power supply	220V 50÷60Hz - 200VA - Compressed air 5 ATM		

Applicable accessories

- Table 400x300 mm
- Indenters and test blocks for the various hardness tests
- Camera with lenses according to the various hardness tests
- Motorised X-Y table for HV 100x100 mm - 25x25 displacement - 0.01 mm division
- Printer for charts, images and statistics
- Tests of depth of surface following hardening treatments
- Table with round plate, diameter 60mm
- "V" shaped piece table for rods of diameters up to 200 mm
- Statistics programs and database
- Measurement of depth of hardness treatment

Digital Unit for Shore readout

- A078.A1.010
  Probe SHORE A with tungsten carbide indenter
- A078.A1.020
  Probe SHORE B with tungsten carbide indenter
- A078.A1.030
  Probe SHORE C with tungsten carbide indenter
- A078.A1.040
  Probe SHORE D with tungsten carbide indenter

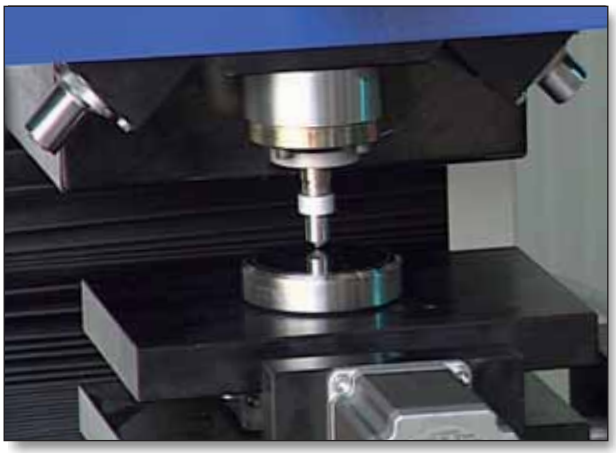
CE

For more information refer to catalogue 01.01-INTEGRAL

OPTION

- Large field of vision
- Camera for automatic sample edge or bar code recognition.
- HDTL for case depth ④.

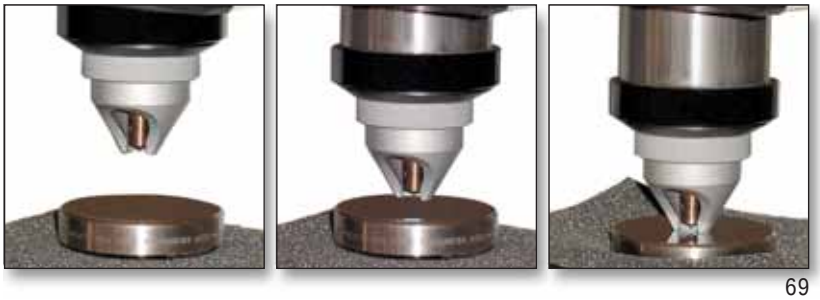
- Clamping system combined with the high technology of the Affri System assure perfect clamping even on unstable or flexible parts



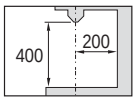
- Rotating turret with 6 positions for automatic switching between indenters and objectives

- Motorised X-Y axis table 200 x 100mm division 0.01 mm combined with automatic start test cycle for hardness case depth studies. The axes are operated independently or combined under programme control.

① **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



SYSTEM AFFRI

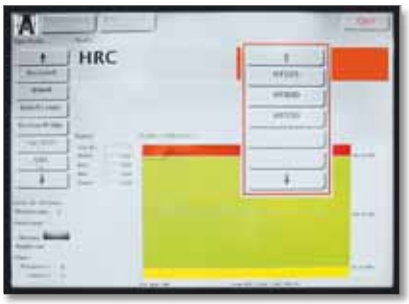


UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

- Fully Automatic Universal Hardness Tester
- It is a non destructive test, automatically measuring the case depth of a heat treated surface from 0.15 to 1.5 mm thickness directly without cutting the sample in HDTL mode.
- Automatic Brinell, Vickers and Rockwell measurements due to the Affri system Closed loop technology inside making the Autofocus for Vickers and Brinell both easy and automatic
- Elevating screw column base for fast adjustments
- Sliding indenter stroke from 50 to 0 mm auto contact with test surface
- Automatic clamping for Rockwell tests (Brinell on request)
- One single start input to activate without interruption the complete automatic test sequence: (contact , load and unload ,auto switching of indenter and optics,auto focus,automatic measurement of hardness depth and release of sample),all without cutting the sample. Simple to use.
- Insensitive to sources of external vibrations
- Insensitive to change of temperature (5 to + 50°C)
- Insensitive to deflections during test cycle
- It can be operative also if is not levelled or if inclined

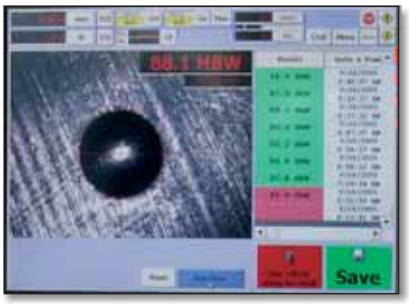
Example of test report for case depth:

```
TEST REPORT
AFFRI - HDTL
Hardness Depth Treatment Loads
Product Code     .............
Operator         .............
Date of test     .............
Vickers          depth measured
HV 525           0.27  mm
HV 550           0.31  mm
HV 600           0.34  mm
Superficial Hardness detected HRC 54.46
```

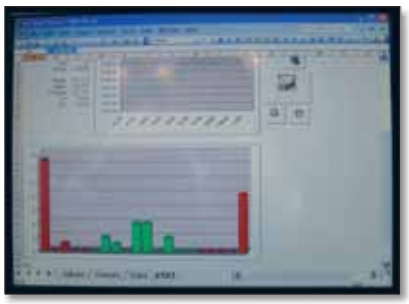


Measurement of hardness case depth treatment without cut sample ④

Scrolling menu on touch screen for easy and simple use



Automatic Brinell / Vickers and Auto Focus



Complete statistic and histogram customized text

Available models

- **INTEGRAL - E 1 (loads from 15.6 to 3000) Brinell**
  Brinell 15.6 31.2 62.5 125 187.5 250 500 750 1000 3000.
- **INTEGRAL - E 2 (loads from 1 to 250) Rockwell+Brinell + Vickers + Shore**
  Brinell 1 5 10 15 15.6 30 31.2 62.5 125 187.5 250, Vickers 1 2 3 5 10 15 30 50 60 100
  Rockwell 15N/T 30N/T 45N/T 60 100 150 HRC A D B F G L M R S T V X Z
  ISO 2039 tests for plastic
- **INTEGRAL - E 3 (loads from 3 to 1000) Brinell + Vickers + Rockwell +Superficial Rockwell + Case depth**
  Brinell: 3 5 10 15.5 31.2 62.5 125 187.5 250 500 1000; Vickers: 3 5 10 15 30 60 100 120
  Rockwell: 60 100 150; Superficial Rockwell: 15 30 45
  HDTL case depth automatic HV 525 - 550 – 600 (at request)
- **INTEGRAL - E 4 (loads from 1 to 50) Brinell + Vickers + Shore**
  Brinell 1 5 10 30 31.2 50, Vickers 1 2 3 5 10 15 30 50, Rockwell 15N/T 30N/T 45N/T
  ISO 2039 tests for plastic
- **INTEGRAL - E 5 (loads from 10 to 3000) Rockwell + Brinell + Vickers**
  Brinell 10 30 31.2 62.5 125 187.5 250 500 750 1000 3000.
  Vickers 10 15 30 50 60 100 120, Rockwell 60 100 150 HRC A D B F G L M R S T V X Z
  HDTL case depth test
- **INTEGRAL - E 6 (loads from 0.3 to 30) Micro Vickers+Superficial Rockwell+Brinell**
  Micro Vickers 0.3 0.5 1 2 5 10 20 30, Brinell 1 5 10 30 31.2, Superficial Rockwell 15 30 45

Range of tests

Brinell	Vickers	Knoop	Rockwell	Shore
HB 1/2.5	HV 1	HK 1	HR 15N	A
HB 1/5	HV 2	HK 2	HR 30N	B
HB 1/10	HV 3	HK 3	HR 45N	C
HB 1/30	HV 5	HK 5	HR 15T W	D
HB 2.5/15.62	HV 10	HK 10	HR 30T W	
HB 2.5/31.2	HV 20	HK 20	HR 45T W	
HB 2.5/62.5	HV 30	HK 30	HR A	
HB 2.5/187.5	HV 50	HK 50	HR B	
HB 5/62.5	HV 100	HK 100	HR C	
HB 5/125	HV 120		HR D	
HB 10/250	(for synthetic material)		HR E	
HB 5/250	HV 49.03N		HR F	
HB 5/750	HV 132.39N		HR G	
HB 10/500	HV 357.9N		HR H	
HB 10/1000	HV 961.0N		HR K	
HB 10/3000			HR L	
			HR M	
			HR alfa	

Technical characteristics

Measures	Automatic Brinell, Vickers, Rockwell and case depth (depending on to the model)		
Resolution	0.1 HR 0.01 mm case depth		
HDTL function	Permits checking the case depth of hardness from 0.15 to 1.5 mm in the range of 525 - 550 - 600 HV1		
Load forces	controlled by internal load cell and closed loop system (Affri patent)		
Test height	max 400 min 0 mm self adjusting according to the test start entry and Handwheel for longer stroke		
Depth	200 mm (others on request)		
Action	A single initiation lowers the head and indenter into auto contact with the test surface auto load ,unload ,auto selection of indenter and optics, auto focus and measurement ,auto retraction to free sample		
Automatic self switching turret: 1 indenter + 1 objective (optional 5 steps 3 indenters + 2 objectives)			
Net work	Internet connection for technical assistance and auto diagnosis		
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy		
Temperature range	+ 5° to + 50° C		
Self aligning to test surface	from 0 to 50 mm		
Compensation of deflection	from 0 to 50 mm range		
Accuracy: Conforms with standards	Brinell EN-ISO 6506-2 Vickers EN-ISO 6507-2	Knoop Rockwell EN-ISO 6508-2	Plastic DIN EN 53456, EN-ISO 2039-2
Max. weight allowed for the specimen to be tested: 200 Kg			
Base	Anvils set available		
Fields of application	For all metals: iron, steel, tempered steel, brass, aluminium and nitriding, cementation, hard facing, plastic		
Size	400x600x1700h		
Net weight	380 Kg		
Packing weight	450 Kg		
Power supply	220V 50÷60Hz - 200VA - Air compressed 5 ATM		

Applicable accessories

- Indenters and test blocks for the various hardness tests
- Camera with lenses to be combined with the various hardness tests
- Motorised X-Y table for HV 100x100 mm - 25x25 displacement - 0.01 mm division
- Printer for charts, images and statistics
- Tests of depth of surface following hardening treatments
- Table with round plate, diameter 60mm
- "V" shaped piece table for rods of up to 200 mm diameter
- Statistics programs and database
- Measurements of depth of hardness treatments

Digital Unit for Shore readout

- A078.A1.010
  Probe SHORE A with tungsten carbide indenter
- A078.A1.020
  Probe SHORE B with tungsten carbide indenter
- A078.A1.030
  Probe SHORE C with tungsten carbide indenter
- A078.A1.040
  Probe SHORE D with tungsten carbide indenter
- A078.A1.050
  Probe SHORE 0 with tungsten carbide indenter
- A078.A1.060
  Probe SHORE 00 with tungsten carbide indenter
- A078.A1.070
  Probe SHORE MICRO with tungsten carbide indenter
- A078.A1.080
  Probe SHORE MICRO A with tungsten carbide indenter

For more information refer to catalogue 01.01-INTEGRAL

OPTION

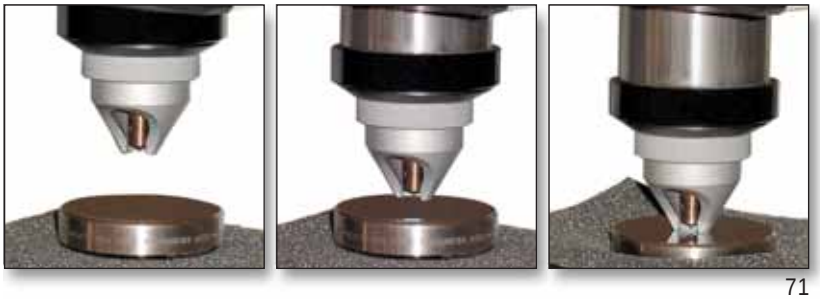
- Large field of vision
- Camera for automatic sample edge or bar code recognition.
- HDTL for case depth ④.

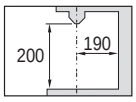
- Clamping system combined with the high technology of the Affri System assure perfect clamping even on unstable or flexible parts

- Rotating turret with 6 positions for automatic switching between indenters and objectives

- Motorised X-Y axis table 200 x 100mm division 0.01 mm combined with automatic start test cycle for hardness case depth studies. The axes are operated independently or combined under programme control.

① **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**





UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

THREE INSTRUMENTS IN ONE

- Combines different instruments in only one machine which is a first in laboratories with optical Vickers - Brinell - Rockwell measurements.
- Very quick and accurate in production environment with automatic Vickers - Brinell - Rockwell measurements.
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagrams, graph, tests lists, averages, standard deviations.
- The instrument and its controls are ergonomically provided with security devices according to CE norms.
- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and saving of results.
- **High resolution of measurement 0.1 HRC** (or **0.01 HRC** on demand), **0.1 HV**
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①

- Following initiation by the Start button, the 270 VRSTV head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Optical gauge high definition 0.1 Micron m. for very accurate Vickers and Brinell measurements
- Automatic compensation of deflection up to 50 mm
- It meets all laboratory requirements.
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- Signal for test cycle end that facilitates the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm²)
- Automatic load application and selection

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

AUTOMATIC MEASUREMENTS

- Camera, computer and software are included for easy Vickers measurements, simply touch the indentation corner using the mouse.

CERTIFICATION

- Supplied with certificates on SIT primary samples.

Technical characteristics 270 VRSTV VM VICKERS

Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf) 2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N
Super Rockwell force	15 30 45 HRN - HRT

Technical characteristics 270 VRSTV

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Self aligning to test surface from 0 to 400 mm	
Clamping	Fix cup optional
Action:	only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase
Mobile Indenter	from 0 to 50 mm multiple till 400 mm
Mobile clamping	from 0 to 50 mm multiple till 400 mm
Magnification	75x 150x 225x 300x
Automatic compensation of deflection piece from 0 to 50 mm	
Reading resolution	0.1 HR-HB-HV (0.01 HR unit, on request) - (0.1 micron m) Vickers Brinell
Reading	CCD camera + computer
Total depth capacity	190 mm
Working table	270x330 mm
Working height	200 mm (700 mm for model 770 VRSD fully motorised)
Max. weight allowed for the specimen to be tested: 2000 Kg	
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Net weight	95 Kg (150 Kg for 770 VRSD)
Packing weight	120 Kg (190 Kg for 770 VRSD)
Packing measure	80x80x150 cm
CCD camera	High resolution, Vickers semi auto / Auto measure

Applicable accessories

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers indenter
- Vickers test blocks
- Knoop indenter
- Knoop test blocks

Brinell
- Ball penetrator 1 - 2.5 - 5 - 10 mm
- Brinell test block

EN-ISO 2039 for plastic
- Ball penetrator 5 mm for EN ISO 2039
- Large clamping base for EN ISO 2039
- Test block for EN ISO 2039 scale
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- Wooden case with accessories
- Hardness conversion table
- Dust cover
- X-Y table 100x100 mm with micrometers div 0.01 mm
- CCD camera screen computer
- Printer
- Table to support hardness tester

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

TV-CCD PC

CCD camera + monitor + computer and Affri software for easy Vickers - Brinell - measurements

TV-CCD PC AUTO

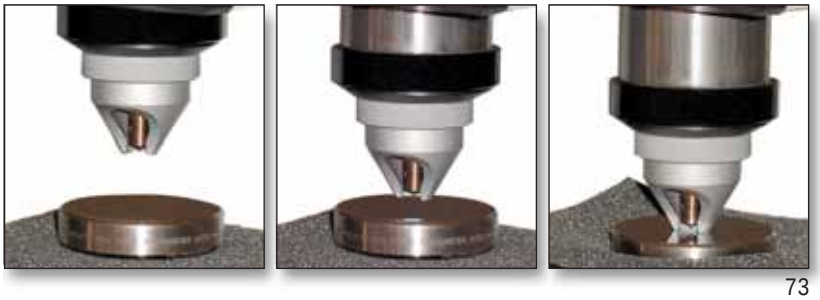
CCD camera + monitor + computer and software for automatic scanning indentation auto measurements

For more information refer to catalogue 01.01-270 VRS

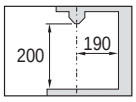
270 VRSTV

Optional screen combined
with camera and software
Semi auto or auto measure

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



SYSTEM AFFRI



UNIVERSAL ROCKWELL - VICKERS - BRINELL

THREE INSTRUMENTS IN ONE

- Combines different instruments in only one machine which is a first in laboratories with optical Vickers - Brinell - Rockwell measurements.
- Very quick and accurate in production environment with automatic Vickers - Brinell - Rockwell measurements.
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagrams, graph, tests lists, averages, standard deviations.
- The instrument and its controls are ergonomically provided with security devices according to CE norms.
- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and saving of results.
- **High resolution of measurement 0.1 HRC** (or **0.01 HRC** on demand), **0.1 HV**
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.
- Wide range of accessories

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①

- Following initiation by the Start button, the 270 VRSTV head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Automatic compensation of deflection up to 50 mm
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- Signal for test cycle end that facilitates the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm²)

AUTO X-Y TABLE

- Motorised table programmable for Zig-Zag test
- 100x200 mm step division 0.005 mm

VERY HIGH PERFORMANCE

- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

AUTOMATIC MEASUREMENTS

- Camera, computer and software are included for easy Vickers measurements, simply touch the indentation corner using the mouse.

CERTIFICATION

- Supplied with certificates on SIT primary samples.

CE

Technical characteristics

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Accuracy: Conforms with standards EN-ISO 6506 / 6507 / 6508 / ASTM-E18 - EN-ISO 2039	
Mode of operation	Automatic
Magnification	150x 250x 400x
Reading resolution	0.1 HR - 0.1HB (0.01 HR unit, on request)
Resolution	0.1 micron m.
Reading	CCD camera + computer
Total depth capacity	190 mm
Working table	270x330 mm
Working height	200 mm
Data output RS 232 C	Yes
Power supply	220V 50÷60Hz - 200VA
Net weight	95 Kg
Packing weight	120 Kg
Packing measurements: 50x50x100 cms	
CCD camera	High resolution 500x, 1000x, 2000x
Monitor	17" b/w high resolution

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Hardness conversion table

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- X-Y table 100x100 mm with micrometers div 0.01 mm
- CCD camera screen computer
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers indenter
- Vickers test blocks
- Knoop indenter
- Knoop test blocks

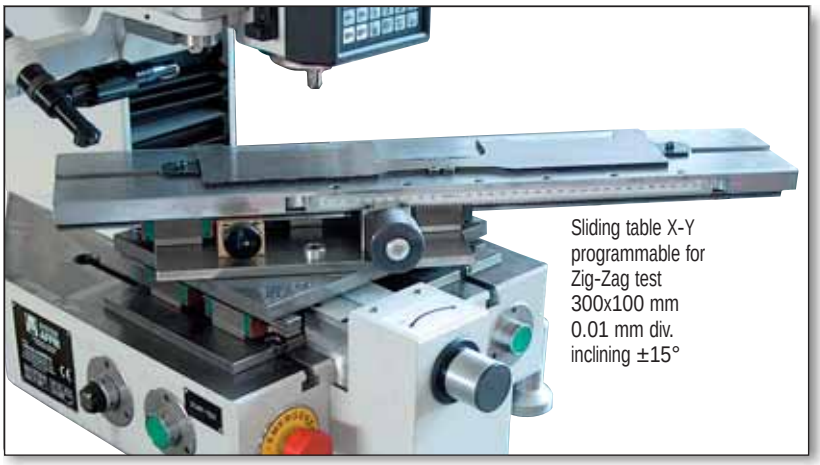
Brinell
- Ball penetrator 1 - 2.5 - 5 - 10 mm
- Brinell test block

Shore

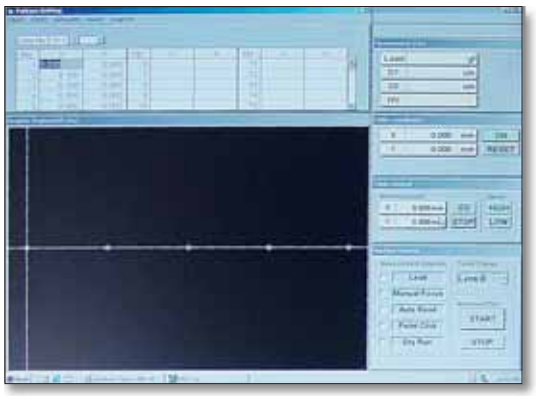
Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-270 VRS

270 VRST VM Auto

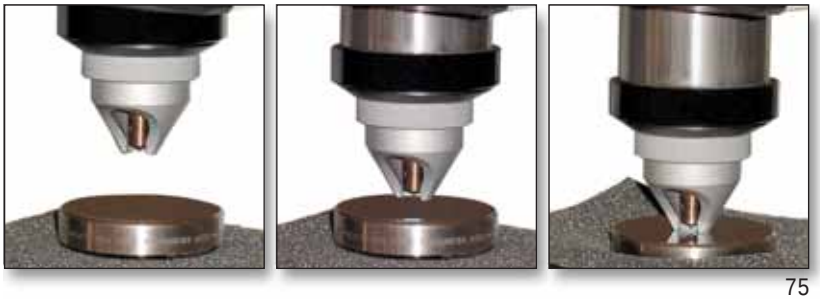


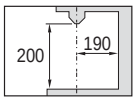
Sliding table X-Y
programmable for
Zig-Zag test
300x100 mm
0.01 mm div.
inclining ±15°



Programmable indexed indentations

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE

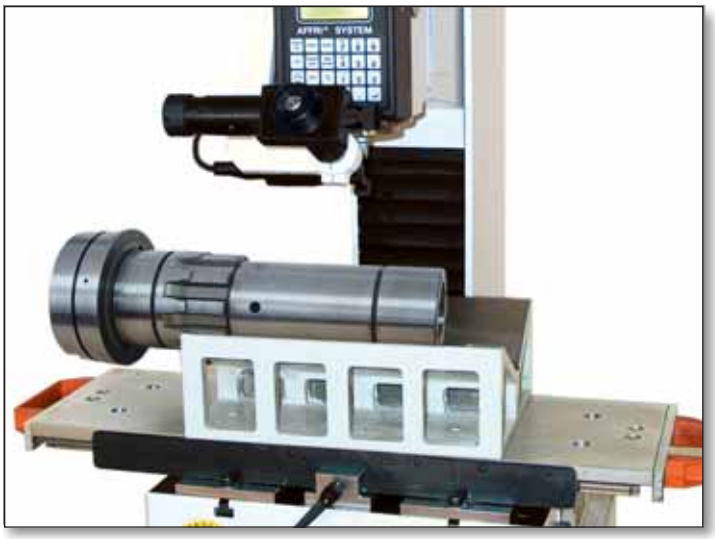




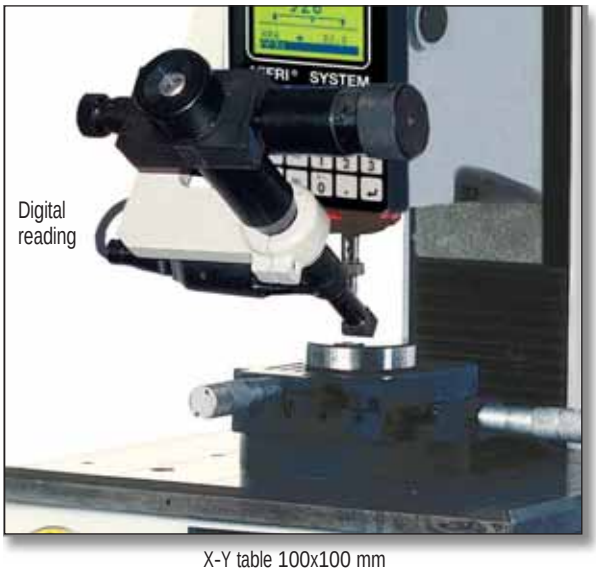
UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

THREE INSTRUMENTS IN ONE

- Combines different instruments in only one machine which is a first in laboratories with optical Vickers - Brinell - Rockwell measurements.
- Very quick and accurate in production environment with automatic Vickers - Brinell - Rockwell measurements.
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagrams, graph, tests lists, averages, standard deviations.
- The instrument and its controls are ergonomically provided with security devices according to CE norms.
- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and saving of results.
- **High resolution of measurement 0.1 HRC** (or **0.01 HRC** on demand), **0.1 HV**
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.
- Optical gauge high definition 0.1 Micron m. for very accurate Vickers and Brinell measurements
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- Signal for test cycle end that facilitates the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm²)



Sleading table (optional)



X-Y table 100x100 mm

CERTIFICATION

- Supplied with certificates on SIT primary samples.

Technical characteristics 270 VRSD VM VICKERS

Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf) 2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N
Super Rockwell force	15 30 45 HRN - HRT

Technical characteristics 270 VRSD

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Self aligning to test surface from 0 to 400 mm	
Clamping	Fix cup optional
Action:	only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase
Mobile Indenter	from 0 to 50 mm multiple till 400 mm
Mobile clamping	from 0 to 50 mm multiple till 400 mm
Magnification	75x 150x 225x 300x
Automatic compensation of deflection piece from 0 to 50 mm	
Reading resolution	0.1 HR-HB-HV (0.01 HR unit, on request) - (0.1 micron m.) Vickers Brinell
Reading	Digital encoder for Brinell - Vickers
Total depth capacity	190 mm
Working table	270x330 mm
Working height	200 mm (700 mm for model 770 VRSD fully motorised)
Max. weight allowed for the specimen to be tested: 2000 Kg	
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Net weight	95 Kg (150 Kg for 770 VRSD)
Packing weight	120 Kg (190 Kg for 770 VRSD)
Packing measure	80x80x150 cm

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Hardness conversion table

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- X-Y table 100x100 mm with micrometers div 0.01 mm
- CCD camera screen computer software for Vickers
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers indenter
- Vickers test blocks
- Knoop indenter
- Knoop test blocks

Brinell
- Ball penetrator 1 - 2.5 - 5 - 10mm
- Brinell test block

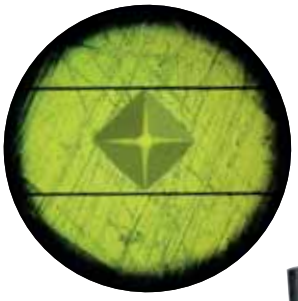
EN-ISO 2039 for plastic
- Ball penetrator 5 mm
- Large clamping base
- Test block

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-270 VRS

270 VRSD



SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①

- Following initiation by the Start button, the 270 VRSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Automatic compensation of deflection up to 50 mm

MOTORISED

- Automatic load application and selection
- Load cell in closed loop AFFRI® patent
- Rapid measurement following contact with indenter
- High precision optical system and rapid measurement
- Large backlit graphical display, with different functions

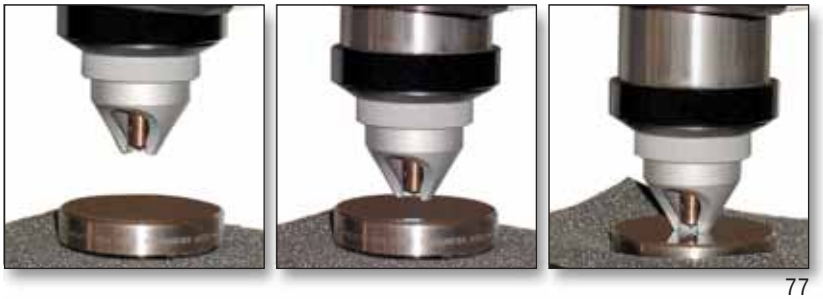
VERY HIGH PERFORMANCE

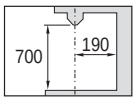
- Measures according to optical absolute method
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

OPTIONAL ACCESSORIES

- Application of camera and computer for electronic analyses on prints and quick Vickers and Brinell measurements.
- Table for displacements on X and Y axis for sewing tests
- Optional equipment: interlocks for quick tests to accommodate a wide variety of test pieces (supports, shafts, forged pieces, semi-finished pieces, finished odds and ends, etc.)

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

THREE INSTRUMENTS IN ONE

- Combines different instruments in only one machine which is a first in laboratories with optical Vickers - Brinell - Rockwell measurements.
- Very quick and accurate in production environment with automatic Vickers - Brinell - Rockwell measurements.
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagrams, graph, tests lists, averages, standard deviations.
- The instrument and its controls are ergonomically provided with security devices according to CE norms.
- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and saving of results.
- **High resolution of measurement 0.1 HRC** (or **0.01 HRC** on demand), **0.1 HV**
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.
- Optical gauge high definition 0.1 Micron m. for very accurate Vickers and Brinell measurements
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- Signal for test cycle end that facilitates the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm^2)

CERTIFICATION

- Supplied with certificates on SIT primary samples.

Sleading table (optional)

X-Y table 100x100 mm

Technical characteristics 770 VRSD VM VICKERS

Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf) 2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N

Technical characteristics 770 VRSD

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 120 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 1177 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Accuracy: Conforms with standards EN-ISO 6506 / 6507 / 6508 / ASTM-E18 - EN-ISO 2039	
Mode of operation	Automatic
Magnification	150x 250x 400x
Reading resolution	0.1 HR - 0.1HB (0.01 HR unit, on request)
Resolution	0.1 micron m.
Reading	Digital
Total depth capacity	190 mm
Working table	270x330 mm
Working height	700 mm - Motorised
Data output RS 232 C	Yes
Power supply	220V 50÷60Hz - 200VA
Net weight	95 Kg
Packing weight	120 Kg
Packing measurements: 50x50x100 cms	
CCD camera	High resolution 500x, 1000x, 2000x
Monitor	17" b/w high resolution

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Hardness conversion table

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- X-Y table 100x100 mm with micrometers div 0.01 mm
- CCD camera screen computer software for Vickers
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers indenter
- Vickers test blocks
- Knoop indenter
- Knoop test blocks

Brinell
- Ball penetrator 1 - 2.5 - 5 - 10mm
- Brinell test block

EN-ISO 2039 for plastic
- Ball penetrator 5 mm
- Large clamping base
- Test block

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-270 VRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①

- Following initiation by the Start button, the 770 VRSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Automatic compensation of deflection up to 50 mm

MOTORISED

- Automatic load application and selection
- Load cell in closed loop AFFRI® patent
- Rapid measurement following contact with indenter
- High precision optical system and rapid measurement
- Large backlit graphical display, with different functions

VERY HIGH PERFORMANCE

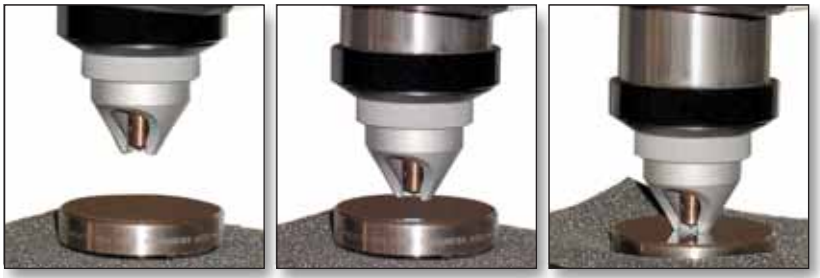
- Measures according to optical absolute method
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

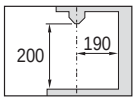
OPTIONAL ACCESSORIES

- Application of camera and computer for electronic analyses on prints and quick Vickers and Brinell measurements.
- Table for displacements on X and Y axis for sewing tests
- Optional equipment: interlocks for quick tests to accommodate a wide variety of test pieces (supports, shafts, forged pieces, semi-finished pieces, finished odds and ends, etc.)

- ***Motorised long stroke from 0 to 700 mm in height***

① **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**





UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

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- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and saving of results
- **High resolution of measurement 0.1 HRC** (or **0.01 HRC** on demand), **0.1 HV**
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.

DIGITAL MEASURING

- Digiting optical measurement on key board it shows immediate Vickers values
- Optical gauge high definition 0.1 Micron m. for very accurate Vickers and Brinell measurements.
- It meets all laboratory requirements.
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- Signal for test cycle end that facilitates the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm²)

X-Y table 100x100 mm

Technical characteristics 270 VRSA VM VICKERS

Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf) 2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N
Super Rockwell force	15 30 45 HRN - HRT

Technical characteristics 270 VRSA

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Self aligning to test surface from 0 to 400 mm	
Clamping	Fix cup optional
Action:	only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase
Mobile Indenter	from 0 to 50 mm multiple till 400 mm
Mobile clamping	from 0 to 50 mm multiple till 400 mm
Magnification	75x 150x 225x 300x
Automatic compensation of deflection piece from 0 to 50 mm	
Reading resolution	0.1 HR-HB-HV (0.01 HR unit, on request) - (0.1 micron m.) Vickers Brinell
Reading	Drum scale + digital readout
Total depth capacity	190 mm
Working table	270x330 mm
Working height	200 mm (700 mm for model 770 VRSD fully motorised)
Max. weight allowed for the specimen to be tested: 2000 Kg	
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Net weight	95 Kg (150 Kg for 770 VRSD)
Packing weight	120 Kg (190 Kg for 770 VRSD)
Packing measure	80x80x150 cm

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Hardness conversion table

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- X-Y table 100x100 mm with micrometers div 0.01 mm
- CCD camera screen computer software for Vickers
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers indenter
- Vickers test blocks
- Knoop indenter
- Knoop test blocks

Brinell
- Ball penetrator 1 - 2.5 - 5 - 10mm
- Brinell test block

EN-ISO 2039 for plastic
- Ball penetrator 5 mm
- Large clamping base
- Test block

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-270 VRS

270 VRSA

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①

- Following initiation by the Start button, the 270 VRSA head moves down to reach

the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:

- approach to the piece;
- clamping of the piece;
- indentation;
- complete measurement cycle and release of piece.

- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Automatic compensation of deflection up to 50 mm

MOTORISED

- Automatic load application and selection
- Load cell in closed loop AFFRI® patent
- Rapid measurement following contact with indenter
- High precision optical system and rapid measurement
- Large backlit graphical display, with different functions

VERY HIGH PERFORMANCE

- Measures according to optical absolute method
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

OPTIONAL ACCESSORIES

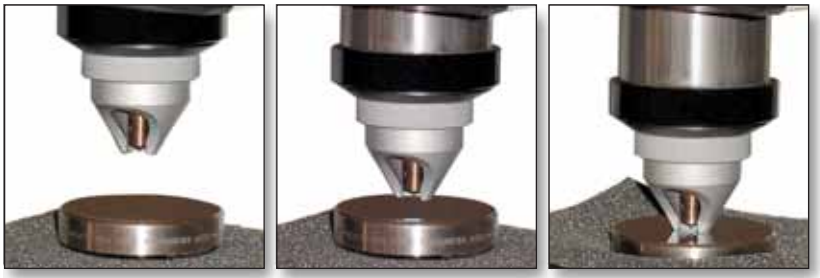
- Application of camera and computer for electronic analyses on prints and quick Vickers and Brinell measurements.
- Table for displacements on X and Y axis for sewing tests
- Optional equipment: interlocks for quick tests to accommodate a wide variety of test pieces (supports, shafts, forged pieces, semi-finished pieces, finished odds and ends, etc.)

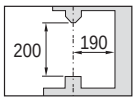
CERTIFICATION

- Supplied with certificates on SIT primary samples.

CE

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

THREE INSTRUMENTS IN ONE

- Combines different instruments in only one machine which is a first in laboratories with optical Vickers - Brinell - Rockwell measurements.
- **Very quick and accurate in the production environment for automatic** Vickers-Brinell-Rockwell measurements.
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagrams, graph, tests lists, averages, standard deviations.
- The instrument and its controls are ergonomically provided with security devices according to CE norms.
- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and saving of results.
- **High resolution of measurement 0.1 HRC** (or **0.01 HRC** on demand), **0.1 HV**
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.

DIGITAL MEASURING

- Inputting of optical measurement on key board will immediately display the Vickers values. A print out is included.
- **Optical gauge high definition 0.1 Micron m. for very accurate Vickers and Brinell measurements.**
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- It meets all laboratory requirements.
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- End of test Signal to aid the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm^2)

CERTIFICATION

- Supplied with certificates on SIT primary samples.

Optional accessory:
Clamping base for big or unstable pieces

Technical characteristics 251 VRSTV VM VICKERS

Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf) 2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N
Super Rockwell force	15 30 45 HRN - HRT

Technical characteristics 251 VRSTV

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Self aligning to test surface from 0 to 50 mm	
Clamping	Fix cup optional
Action: only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase	
Mobile Indenter	from 0 to 50 mm
Mobile clamping	from 0 to 50 mm
Magnification	75x 150x 220x 300x
Automatic compensation of deflection piece from 0 to 50 mm	
Reading resolution	0.1 HR-HB-HV (0.01 HR unit, on request) - 0.1 micron m.
Reading	CCD camera + computer
Total depth capacity	190 mm
Working height	200 mm
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Net weight	75 Kg
Packing weight	95 Kg
Packing measurements	50x50x100 cms
CCD camera	High resolution, Vickers semi auto / Auto measure

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Hardness conversion table

On request
- Flat anvil 60 mm
- "V" anvil 60 mm
- Flat and "V" double anvil
- X-Y table 100x100 mm with micrometers div 0.01 mm
- Clamping adjustable base ②
- CCD camera screen computer
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell test blocks C-B-N-T

Vickers
- Vickers indenter - Vickers test blocks - Knoop indenter - Knoop test blocks

Brinell
- Ball penetrator 1- 2.5 - 5 -10 mm - Brinell test block

EN-ISO 2039 for plastic
- Ball penetrator 5 mm - Large clamping base - Test block

Shore
Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

TV-CCD PC

CCD camera + monitor + computer and Affri software for easy Vickers - Brinell - measures

TV-CCD PC AUTO

CCD camera + monitor + computer and software for automatic scanning indentation auto measures

For more information refer to catalogue 01.01-251 VRS

251 VRSTV

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①

- Following initiation by the Start button, the 251 VRSTV head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Automatic compensation of deflection up to 50 mm

MOTORISED

- Automatic load application and selection
- Load cell in closed loop AFFRI® patent
- Rapid measurement following contact with indenter

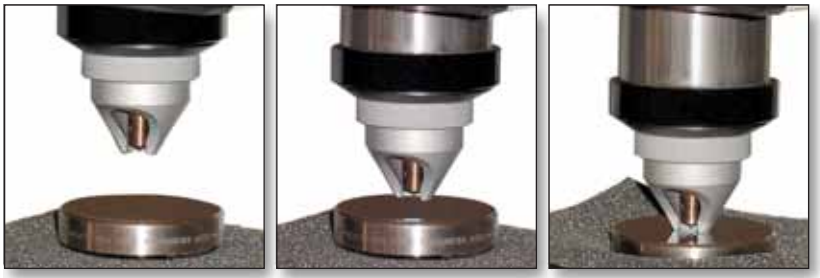
VERY HIGH PERFORMANCE

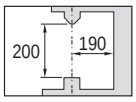
- Measures according to optical absolute method
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

AUTOMATIC MEASURING

- Camera, computer and software are included for easy Vickers measurements, simply touch the corner of the indention using the mouse.

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





UNIVERSAL ROCKWELL - SUPERFICIAL ROCKWELL - VICKERS

ABSOLUTE PRECISION

- Unrivalled accuracy with no misalignment or undesired shifts.
- **Optical gauge high definition 0.1 Micron m. for very accurate Vickers and Brinell measurements.**
- It meets all laboratory requirements.
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- End of test Signal for to aid the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm^2)

UNIVERSAL USE

- It incorporates different instruments in only one machine which is an absolute first in laboratories with optical Vickers - Brinell - Rockwell measurements.
- **Very quick and accurate in the production environments for automatic Vickers - Brinell - Rockwell measurements.**
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagrams, graphs, test lists, averages, standard deviations.
- The instrument and its controls are ergonomically provided with security devices according to CE norms.
- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measure on round surfaces and saving of results.
- **High resolution of measurement 0.1 HRC** (or **0.01 HRC** on demand), **0.1 HV**
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.

CERTIFICATION

- Supplied with certificates on SIT primary samples.

Technical characteristics 251 VRSD VM VICKERS

Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf) 2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N
Super Rockwell force	15 30 45 HRN - HRT

Technical characteristics 251 VRSD

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Self aligning to test surface from 0 to 50 mm	
Clamping	Fix cup optional
Action: only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase	
Mobile Indenter	from 0 to 50 mm
Mobile clamping	from 0 to 50 mm
Magnification	75x 150x 220x 300x
Automatic compensation of deflection piece from 0 to 50 mm	
Reading resolution	0.1 HR-HB-HV (0.01 HR unit, on request) - 0.1 micron m.
Reading	Digital encoder for Brinell - Vickers
Total depth capacity	190 mm
Working height	200 mm
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Net weight	75 Kg
Packing weight	95 Kg
Packing measurements	50x50x100 cms

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Hardness conversion table

On request
- Flat anvil 60 mm
- V anvil 60 mm
- Flat and "V" double anvil
- X-Y table 100x100 mm with micrometers div 0.01 mm
- CCD camera screen computer software for Vickers
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter
- Rockwell B-T indenter
- Rockwell C-B-N-T test block

Vickers
- Vickers indenter
- Vickers test blocks
- Knoop indenter
- Knoop test blocks

Brinell
- Ball penetrator 1 - 2.5 - 5 - 10 mm
- Brinell test block

EN-ISO 2039 for plastic
- Ball penetrator 5 mm for EN ISO 2039
- Large clamping base for EN ISO 2039
- Test block for EN ISO 2039 scale

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-251 VRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE①

- Following initiation by the Start button, the 251 VRSD head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Automatic compensation of deflection up to 50 mm

MOTORISED

- Automatic load application and selection
- Load cell in closed loop AFFRI® patent
- Rapid measurement following contact with indenter

VERY HIGH PERFORMANCE

- Measures according to optical absolute method
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

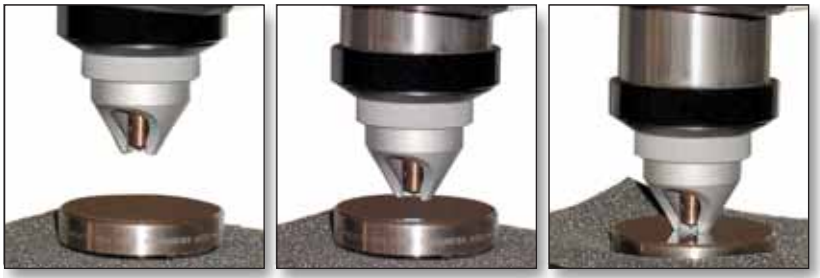
OPTIONAL ACCESSORIES

- Application of camera and computer for electronic analysis on prints and quick Vickers and Brinell measurements.
- Table for displacements on X and Y axes for sewing tests

Digital optical reading

Optional accessory:
Clamping base for large or unstable pieces

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



DIGITAL MEASUREMENTS

Following inputting of the optical measurements on the key board the Vickers value will be displayed values. A print out is included.

ABSOLUTE PRECISION

- Unrivalled accuracy with no misalignment or undesired shifts.
- **Optical gauge high definition 0.1 Micron m. for very accurate Vickers and Brinell measurements.**
- It meets all laboratory requirements.
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- **Unparalleled accuracy, repeatability and reproducibility** in all test conditions (0.1 HV) which can be checked in operation condition within 8%
- Application of load and indenter penetration on the same axis in order to obtain absolute hardness measurements.
- Graphical illuminated display with high contrast to obtain clear, quick and accurate readings.
- Icons facilitate the operator in identifying software functions.
- End of test Signal for to aid the operator.
- **Automatic control and selection of pre-loads and main load** using software controlled closed-loop with load cell (AFFRI® Patent).
- Single button operator selection of test load and measurement scale.
- Simultaneous conversion between different scales (Rockwell, Brinell, Vickers, N/mm²)

UNIVERSAL USE

- It incorporates different instruments in only one machine which is an absolute first in laboratories with optical Vickers - Brinell - Rockwell measurements.
- **Very quick and accurate in the production environment for automatic Vickers - Brinell - Rockwell measurements.**
- Effective statistics software incorporated with connection to printer or computer in order to supply: diagrams, graphs, test lists, averages, standard deviations.
- The instrument and its controls are ergonomically provided with security devices according to CE norms.
- Software includes settings in three selection classes in order to simplify the insertion of the instrument into a production line.
- Programmable load dwell time 0.1 second increment
- Automatic correction of measurements on round surfaces and saving of results
- High resolution of measurement 0.1 HRC (or 0.01 HRC on demand).
- Reversion from automatic to semi-automatic operation for single tests.
- **Two years full warranty** as assurance of high quality.

CERTIFICATION

- Supplied with certificates on SIT primary samples.

Digital optical reading

Technical characteristics 251 VRSA VM VICKERS

Vickers force	(0.3 0.5 1 2 2.5 3 5 10 15 20 30 50 Kgf) 2.94 4.9 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 490 N
Super Rockwell force	15 30 45 HRN - HRT

Technical characteristics 251 VRSA

Vickers Knoop loads	(1 2 2.5 3 5 10 15 20 30 60 100 Kgf) 9.81 19.6 24.5 29.43 49.05 98.1 147.15 196 294.3 588.6 981 N
Rockwell loads	(10 60 100 150 Kgf) 98.10 588.60 981 1471.50 N
SuperRockwell loads	(3 15 30 45 Kgf) 29.43 147.15 294.30 441.45 N
Brinell loads	(5 6.25 10 15.6 25 30 31.2 62.5 125 187.5 Kgf - on request extra 250 Kgf) 49.05 61.3 98.1 153.23 245 294.43 306.5 613 1226 1839 N (on request 2452)
Optional test loads	49 132 358 961 N (for plastic, rubber as per EN-ISO 2039 std) (250 Kgf) 2452.5 N Brinell
Shore	A - B - C - D
Operation	it can work if not levelled, inclined or near to vibration area, without losing accuracy
Temperature range	+ 5° to + 50° C
Self aligning to test surface from 0 to 50 mm	
Clamping	Fix cup optional
Action: only one start input moves down head to take contact and clamp the test surface from distance multiple of 50 mm and automatically starts the hardness cycle in automatic succession without breaking a phase	
Mobile Indenter	from 0 to 50 mm
Mobile clamping	from 0 to 50 mm
Magnification	75x 150x 220x 300x
Automatic compensation of deflection piece from 0 to 50 mm	
Reading resolution	0.1 HR-HB-HV (0.01 HR unit, on request) - 0.1 micron m.
Reading	Drum scale + digital readout
Total depth capacity	190 mm
Working height	200 mm
Data output	RS 232 C
Power supply	220V 50÷60Hz - 200VA
Net weight	75 Kg
Packing weight	95 Kg
Packing measurements	50x50x100 cms

Applicable accessories

Standard
- Wooden case with accessories
- Dust cover
- Power cord
- User manual
- Hardness conversion table

On request
- Flat anvil 60 mm
- V anvil 60 mm
- Flat and "V" double anvil
- X-Y table 100x100 mm with micrometers div 0.01 mm
- CCD camera screen computer software for Vickers
- Printer
- Table to support hardness tester

Rockwell
- Rockwell C-N indenter - Rockwell B-T indenter - Rockwell C-B-N-T test block

Vickers
- Vickers indenter - Vickers test blocks - Knoop indenter
- Knoop test blocks

Brinell
- Ball penetrator 1 - 2.5 - 5 - 10 mm - Brinell test block

EN-ISO 2039 for plastic
- Ball penetrator 5 mm - Large clamping base - Test block

Shore

Digital Unit for Shore readout
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

For more information refer to catalogue 01.01-251 VRS

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①
- Following initiation by the Start button, the 251 VRSA head moves down to reach the test surface in distance multiples of 50 mm as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.
- Perfect and effective measurements including the first test
- Insensitive to deflection
- Automatic compensation of deflection up to 50 mm

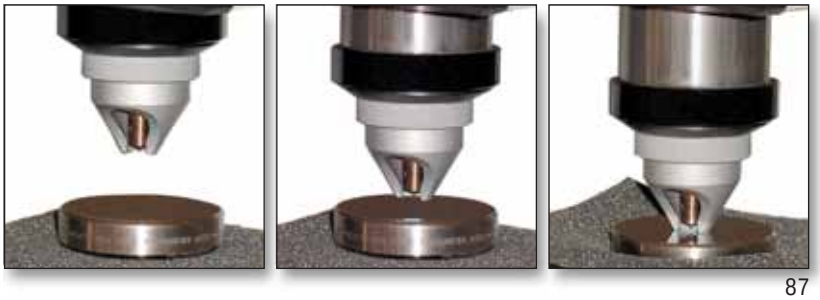
MOTORISED
- Automatic load application and selection
- Load cell in closed loop AFFRI® patent
- Rapid measurement following contact with indenter
- High precision optic system and rapidity of measurement
- Large and graphical display, with different functions and illumination in the back

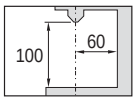
VERY HIGH PERFORMANCE
- Measures according to optical absolute method
- Unaltered operation even in extreme conditions: irregular, unfinished raised or misaligned pieces, every kind of support (lifting screw, deformable materials, etc.) presence of impurities (dust, oil, etc.) between the test piece and the support or between the support and the point of the support.

OPTIONAL ACCESSORIES
- Application of camera and computer for electronic analysis on prints and quick Vickers and Brinell measurements.
- Table for displacements on X and Y axes for sewing tests

Optional accessory:
Clamping base for large or unstable pieces

① AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE





Field of application for AFFRI® Microtester

	< soft ..... hard >	
HRA - Rockwell A	20 – 92	For hard steel, nitriding, cementation, roller, steel for tools, soft and hard materials
HK - Knoop	25 – 97	For soft steel, non ferrous metals
HRC - Rockwell C	0 – 80	For hard steel, nitriding, cementation, roller, steel for tools
HRB - Rockwell B	26 – 100	For soft steel, non ferrous metals
HR30T - Rockwell 30T	16 – 83	For soft steel, non ferrous metals
HB5 - Brinell 5	5 – 205	For aluminium, soft aluminium alloy cast iron, bronze, brass
HB30 - Brinell 30	66 – 884	For heat treated steel, annealed steel, drawn products, deep-drawn strip
HV - Vickers	13 – 1865	For all material
R - Tensile module N/mm²	226 – 2898	For heat treated steel, annealed steel, drawn products, deep-drawn strip
HR15N - Rockwell HR15N	69 – 93	For hard steel, nitriding, cementation, roller, steel for tools

The **MICROTESTER** works with a method similar to the classic unified Rockwell laboratory hardness testers, so it is fully certifiable in accordance with EN-ISO 10109 and ASTM standards.

Perfect and effective measurements including the first test.

The force on the diamond point is electronically controlled by an electronic load micro-cell directly inserted in the indenter (AFFRI® Patent).

The displacement detector includes the diamond and its support guide and it assures an **absolute measurements** with no interference due to movements, flexions and vibrations.

It is possible to measure in an absolutely accurate way **thin layers** such as metal sheets, **chrome plating** only few hundredths of mm thick, very small pieces, nitrided layers and it is possible to measure with ease very large structures such as steel castings and moulds. It does not work using rebound, but with a real measurement of the indentation of the material. It is handy, light and very easy to use.

- **The MICROTESTER executes Automatic** and **immediate microvickers measurements** without the need for optical measurements.
- **Less effort, more accuracy**, 2 seconds to perform a micro-hardness measurement
- **An invaluable help both in the laboratory and in the manufacturing process** for rapid,low cost,non destructive , direct and accurate measurements on parts during production.
- Conversion of the results to different Rockwell Brinell scales showed on the display. Functions such as: tensile strength, calculation of average, statistics, storage of data and output to printer are already included in the micro-tester software.
- **Increase your production quality** by checking your products directly during manufacturing. Selective sampling is ineffective. 100% testing of production is possible at a lower price than the price of sampling.
- The principle of operation is the same as the laboratory machines and it is certified according to EN ISO 10109 - ASTM standards.
- **Very high reliability and versatility of use**, with a very wide range of supports pieces of any shape can be tested , from the point of a dentist's drill to razor blades and many other pieces. Simply select the desired hardness scale and pressure to apply the test load. When the audio signal is heard, the test is completed and the results are instantaneously displayed. The MICROTESTER is now ready for use again. It's that easy.
- **Interface for versatility.** The microprocessor based controller can store more than 300 test results simultaneously, or be connected directly to a computer through the RS-232 interface, to a fixed or portable printer, making the MICROTESTER a practical and versatile hardness tester.

Technical characteristics

Principle of operation	load with electronic control (9.81 N)
Fields of application	for all metals
Digital scale read out (other scales on request)	Rockwell HRA (20...92); HRB (26...100); HRC (0...80); HR15N (69...93); HR30T (16...83) Brinell HB5 (5.. .205); HB30 (66...884) Knoop (25...97) Vickers (13...1865) Tensile Module R (226.. .2898) HZA (0...250) Webster B 0 – 20 (on request) Barcol 0 – 100 (on request)
Display resolution	0.1 HV
Repeatability	± 0.3% on reference test block
Storage of test results	300 tests
Data transmission	RS 232 C
Statistics and mean of results	
Display	L C D
Printer	Portable, 20 column thermal paper, rechargeable battery, measures (15 x 10 x 4 cm)
Power supply	1 rechargeable battery
Operating time	1000 tests
Automatic shut off after a pause of 2 minutes. Button reactivation	
Total height capacity	100 mm (other on request - see art 2313)
Minimum thickness measurable	0.05 mm 600 Vickers
Ø measurable	from 0.5 mm 100 mm
Total depth capacity	60 mm
Dimension of electronic box	160 x 90 x 50h mm
Weight	2.5 kg

Applicable accessories

Standard

- Vickers indenter
- "V" anvil for Ø from 1 to 10 mm
- "V" anvil for Ø from 10 to 30 mm
- Flat anvil

Extra

- Printer
- Cable for computer
- Motor drive

CE

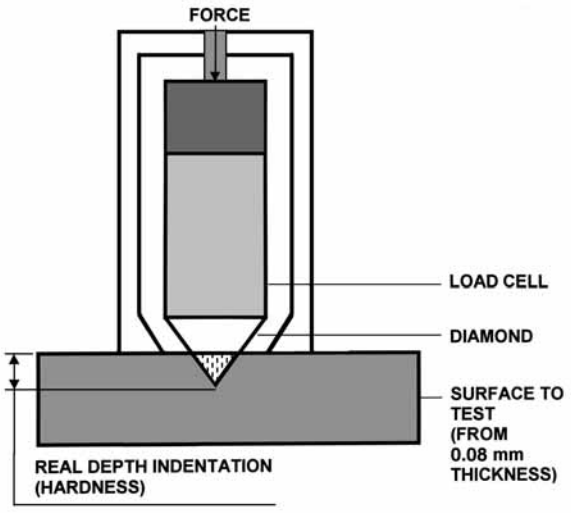
For more information refer to catalogue 01.01-MICROTESTER

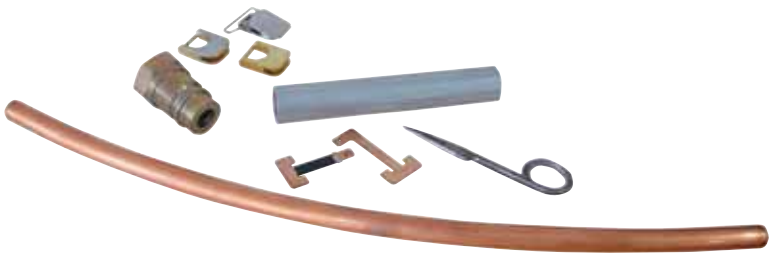
AUTOMATIC MICROVICKERS

- *For thin layers, chromium coverings from 0.05 mm thickness*
- *Direct Vickers read-out*
- *Conversion to Rockwell, Brinell*
- *Data output for printer*
- *Microscope not needed*
- *Statistic software*
- *High precision rapid measurements*

PRINCIPLE OF OPERATION:

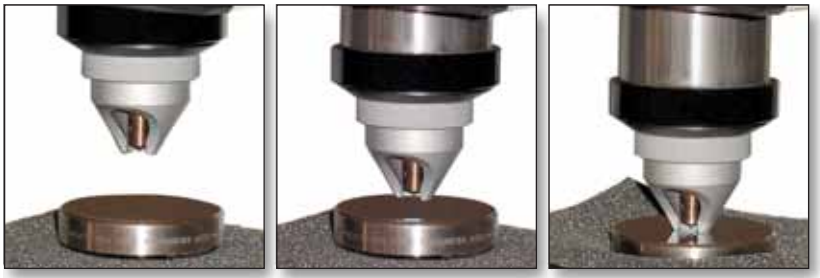
The difference in displacement during indentation of an electronically loaded and controlled diamond point (with an initial minor force and a final major force) determines the hardness scale of the tested metal layer.



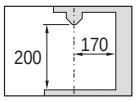


Examples of parts which can be tested

AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE

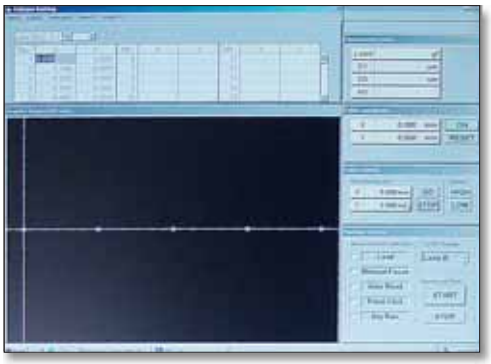


SYSTEM AFFRI



AUTOMATIC MICRO VICKERS

- It is a version derived from the 270 VRS series for automatic Vickers measurements with full electronic detection and software for immediate Vickers results.
- Single initiation of automatic test sequence comprising:
  - auto contact with the test sample over extended stroke of head for 50 mm and more
  - including automatic clamping
  - compensation for deflection of test piece or test surface up to 50 mm
  - minor-load application
  - major load application
  - removal of major load
  - readout and removal of the minor load
  - raise head up to 50 mm to release sample
  - uninterrupted sequence: with incremental force created using load cell and closed loop integral AFFRI system.
- The minor and major force are generated directly on the axis of indenter eliminating errors due to lever ratio.
- Height capacity from 0 to 200 mm
- Depth capacity 170 mm
- Large base 270x330 mm to accommodate both light and heavy parts for secure stability of test pieces and accurate measurements in every condition , unaffected by dust, oil, or flexible parts such as a spring. Able to support samples up to 2000 Kg.



Programmable step by step indentations

Technical characteristics

Test load programmable	(0.2 0.5 1 2 3 5 10 15 30 Kgf) 1.96 4.90 9.81 19.6 29.43 49.05 98.1 147 294 N - Vickers
Test Load	147 - 294 - 441 N (15-30-45 Kgf) Superficial Rockwell
Readout	HV - HRC
Readout resolution	0.1HV - 0.1 HRN
Test time	programmable
Data out	RS 232C output data
Weight	70 Kg
Height capacity	from 0 to 200 mm
Input	Single initiation for entire cycle including auto-contact of test sample plus full hardness cycle
Power supply	220V 50÷60Hz - 200VA

Applicable accessories

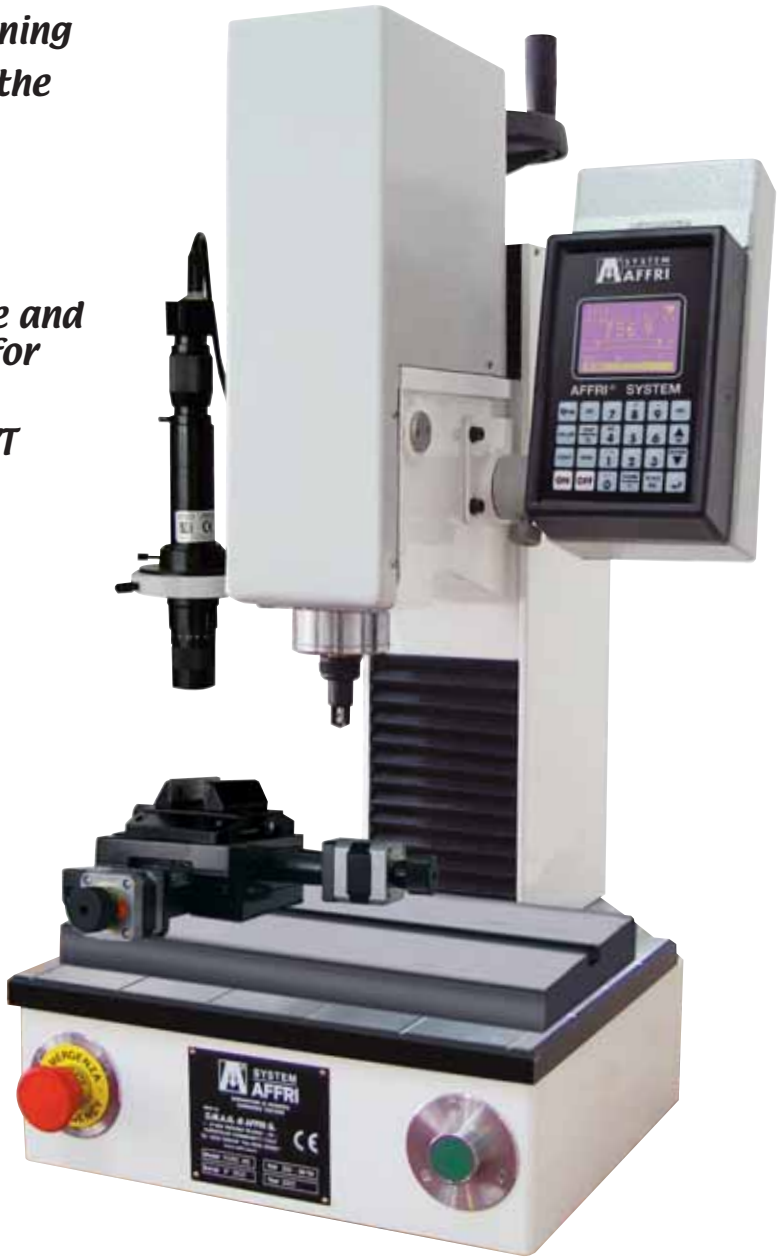
Standard

- Diamond Indenter for Vickers
- Vickers test block
- Motorised X-Y table 100 x 100 mm div. 0.01 mm
- Manual X-Y table 100 x 100 mm div. 0.01 mm
- Computer and software to programm automatic cycles step by step
- Printer

1 "V" anvil Ø60
1 Flat anvil Ø60
1 Combined spot anvil for small round and flat pieces
1 Wooden case
1 Calibration certificate
1 Warranty certificate
1 Hardness conversion table
1 Dust Cover
1 HRN Diamond penetrator
1 HRT ball penetrator Ø1/16"
1 HR30N test block
1 HR30T test block

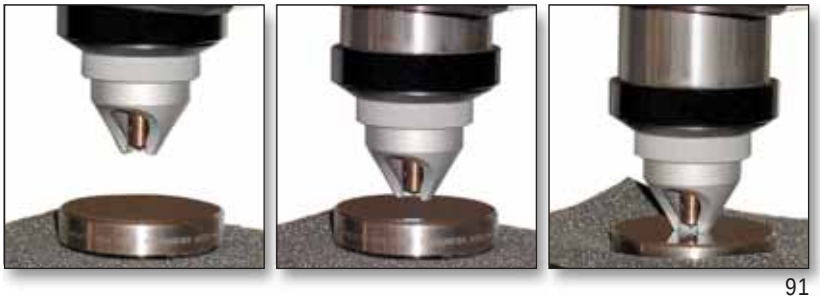
CE

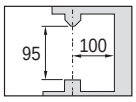
- *Saves time and does not require sample preparation*
- *Does not require mirror surface cleaning*
- *Non destructive test, you can check the test piece without cutting*
- *Save 40% on equipments costs*
- *Save 80% on test time*
- *Easy to motorize X-Y table for fully automatic tests series on the sample and automatically locate test positions for Zig-Zag tests*
- *Direct readout HV 0.2 to HV 10 by HVT system*
- *Diagrams of depth following heat treatment are available*



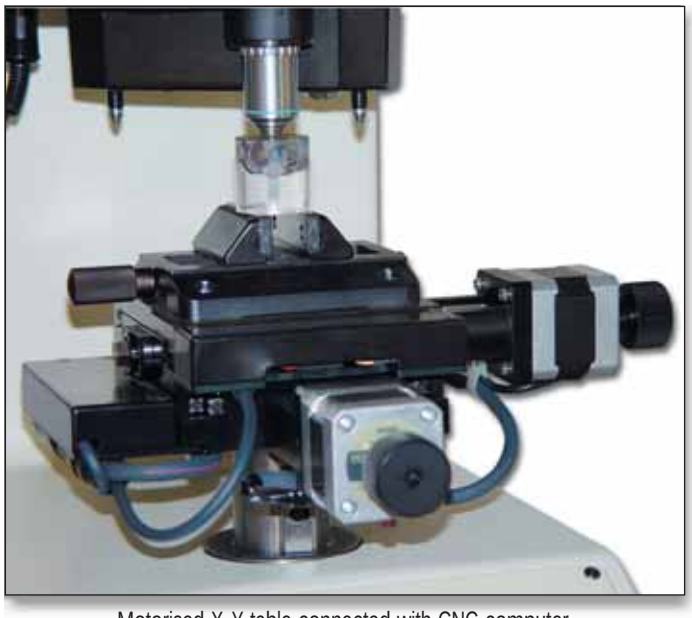
Automatic Vickers

AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE

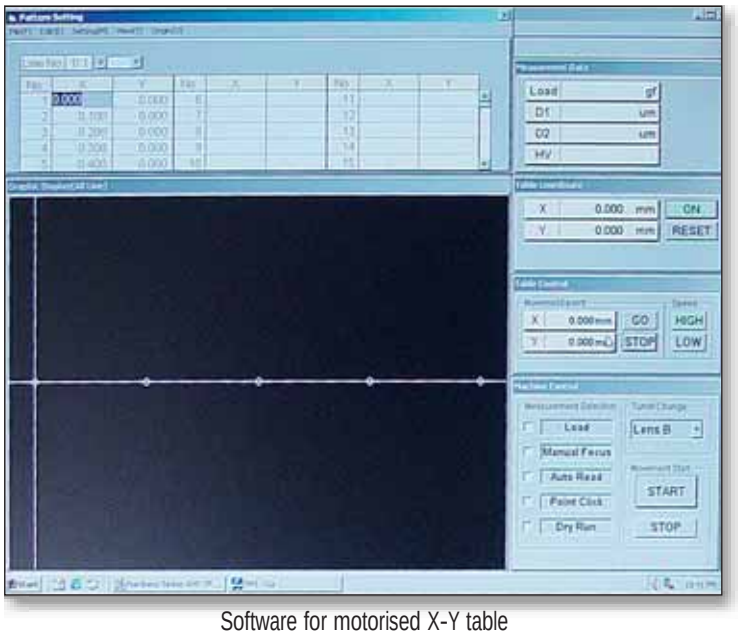




MICRO-MACRO VICKERS



Motorised X-Y table connected with CNC computer for automatic tests (optional)



Software for motorised X-Y table

Applicable accessories

Optional
- Knoop indenter
- Knoop test block
- Printer
- Motorised X-Y table connected with CNC computer for automatic tests (optional)

TAURUS 5
Simply software and camera Auto measure Vickers+ Manual Vickers

SOFTWARE FOR QUICK MEASURE FM20A04 PROCEDURE LEVEL 1

SOFTWARE FOR AUTOMEASURE, FM20A10 PROCEDURE LEVEL 1

SOFTWARE FOR AUTOMATIC X - Y TABLE, QUICK MEASURE, LEVEL II

FULLY AUTOMATIC SYSTEM

Standard	DM-2 A	DM-2 D
- Manual X-Y stage (Built in)	1	1
- Precision vice	1	1
- Standard test block (HMV700)	1	1
- Diamond indenter for HV (Built in)	1	1
- Measuring microscope electronic type	-	1
- Measuring microscope mechanical type	1	-
- TV CCD Auto Measure	opt.	opt.
- X-Y table motorised, programmable step	opt.	opt.
- Software for easy Vickers measure	opt.	opt.
- Object lens (Built in) x10	1	1
- Object lens (Built in) x40	1	1
- Level adjusting leg	4	4
- Light source bulb (12V 18W)	2	2
- Auxiliary tools	1 set	1 set
- Instruction manual	1	1
- Accessories box	1	1

Technical characteristics

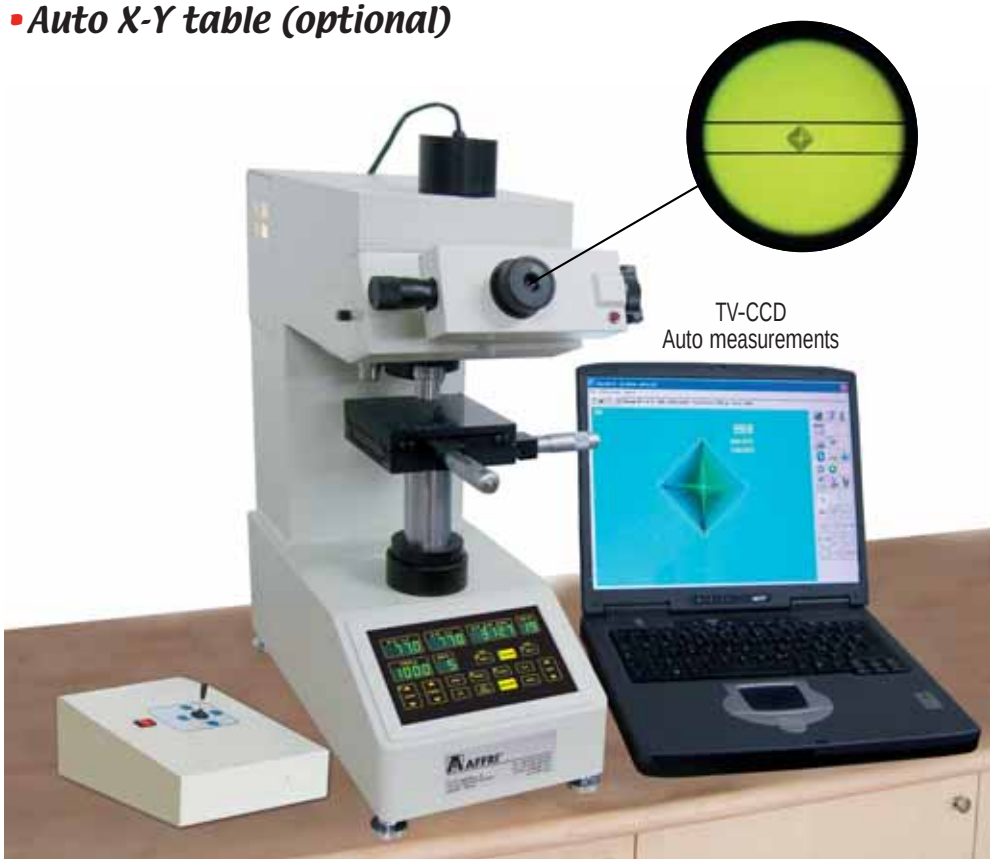
		DM-2 A	DM-2 D
Test load	(mN) N	(98.07 245.2 490.3 980.7 1961 2942 4903 9807)	
	(gf) Symbol	(10 25 50 100 200 300 500 1000)	
Dwell time		5~40sec.	5~99sec
Measuring microscope	Max. measuring length	250 µm	250 µm
	Min. graduation	0.5 µm	0.1 µm
	Min. measuring unit	0.1 HV	0.1 HV
Read out		Analogic	Digital
Data output		-	Centronics
Magnification		100x - 400x	
Max. height of specimen		95 mm	
Max. depth of specimen		100 mm	
Dimensions main body only		W220xD400xH500	
Weight		28 kg	
Load applying speed		50 µm/sec	
Auto-turret		Yes	
Loading mechanism		Automatic loading and releasing method	
Accuracy		According to JIS B 7734 and ASTM E-384	
Photographic device		Possible to mount at anytime (camera sleeve:optional)	
Power supply		Single phase AC100~240V 50/60Hz available	

CCD flat camera transmits the image to the computer and AFFRI EASYDUR® Software for fast and automatic Vickers measurements eliminates human errors, saves data, performs statistics, prints out results (optional).

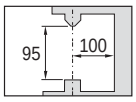
Auto turret to select indenter and objective.

Control panel integrated with ergonomic touch keyboard. 2 digit large LED indication of load force applied, Load time, Diagonal 1 and Diagonal 2, Hardness results, number of measurements stored, average, statistics. HV and HK (Knoop test can be made using selector switch and fitting the appropriate Knoop indenter (accessory).

- *Micro hardness tester*
- *Auto turret*
- *400x - 100x magnification*
- *Auto measurements (optional)*
- *Auto X-Y table (optional)*



TV-CCD
Auto measurements



MICRO-MACRO VICKERS

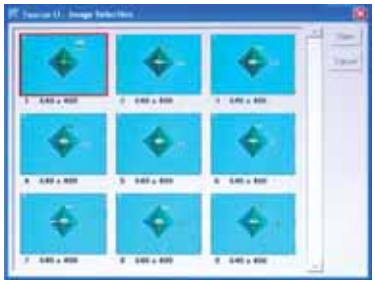
CCD camera for display of indentations with connection to PC software for automatic Vickers measurements.

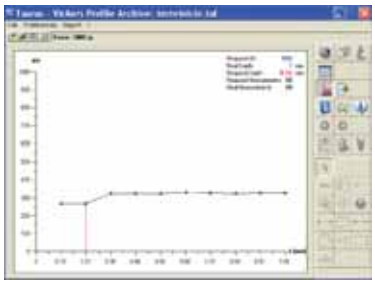
Digital display of load, dwell time, Vickers result, number of test conversion of result to Rockwell, Brinell scale

Conforms to the ISO 6507.2 , ASTM E 384, JISB 7734
Automatic turret to select indenter and objective

Technical data

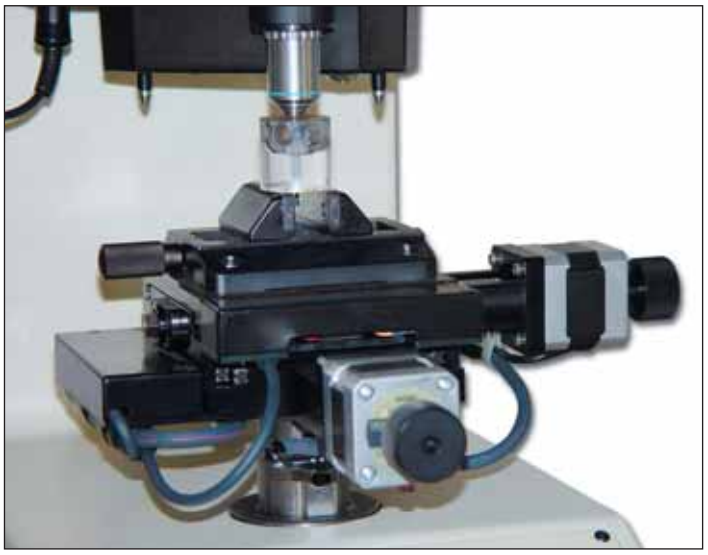
	DM-5 A	DM-5 B
Test loads	0.3 0.5 1 3 5 10 20 30	1 2 3 5 10 20 30 50
Digital Display	Vickers, Brinell, Rockwell C	
Data output	RS32 C	
Objective	10x - 20x	10x
Magnifications	100x - 200x	100x
Field of vision	900µm (100x); 450 µm (200x)	900µm (100x)
Division	0.5µm (100x); 0.1 µm (200x)	0.5µm (100x)
Switch objective/indenter	manual turret (motorised option)	manual turret
Eyepiece	digital encoder 10x	
Table	X - Y 100x100 travel 25x25 division 0.01 mm	
Camera connection	optional special adaptor	
Height capacity	max 160 mm w. flat anvil	
Depth capacity	160 mm	
Digital display	of programmed load	
Digital display	dwell time 1 to 99 sec. programmable	
Digital display	No. of tests	
Light	adjustable via key board	
Power source	220 240 V single phase	
Weight	55 Kg	
Dimension	55 x 30 x 700H cm	





Software Taurus: Automatic Vickers measurements, data storage, create case depth diagram and test report. Easy and simple action.

For more information refer to catalogue 03.01-DM-2 / 04.01 DM



MOTORISED X-Y TABLE connected with CNC computer for automatic tests

Turret auto switch indenter and objective (2 objectives for DM5A, 1 objective for DM5B)

Fast selection of test load using rotary switch.

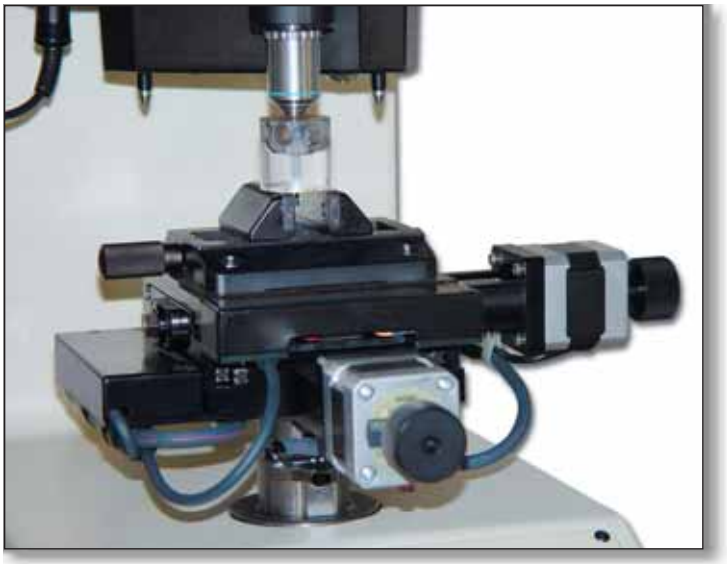
Applicable accessories

STANDARD ACCESSORIES
- 136° Vickers indenter
- HV test block
- Anvil flat 50 mm
- V face anvil 50 mm
- Spare bulb
- Eyepiece 10x
- Objective 10x
- User manual
- Cable cord
- Certificate of calibration

OPTIONAL ACCESSORIES
n. 1 Motorised turret for DM5A
n. 1 Objective 20x (for DM5A only)
n. 1 X - Y table 100 x 100 mm 25 x 25 mm travel 0.01 mm division
n. 1 Software Taurus for automatic Vickers measure and case depth diagram
n. 1 CCD camera adapter
n. 1 Vice 25 mm capacity.

DM-8 C

X-Y table 100 x 100 mm 0.01 mm division is included for easy location of test surface or Zig-Zag tests. OPTIONS: 2 Digital micrometers



Motorised X-Y table connected with CNC computer for automatic tests

Technical characteristics

		DM-8 A and B
Auto-turret		2 Indenters + 4 Objectives
Max. height of specimen		120 mm
Max. depth of specimen		160 mm
Reading		Digital - Touch panel
DM-8A	mN	49.03 98.07 245.2 490.3 980.7 1961 2942 4903 9807
	(gf)	5 10 25 50 100 200 300 500 1000
DM-8B	mN	9.807 29.42 49.03 98.07 245.2 490.3 980.7 1961 2942 4903 9807 19614
	(gf)	1 3 5 10 25 50 100 200 300 500 1000 2000
Measuring microscope		Max. measuring length 250 µm Min. graduation 0.01 µm Min. measuring unit 0.01 µm
Loading mechanism		Automatic loading and releasing method
Load applying speed		50 µm/sec
Dwell time		5~60 sec
LCD type touch panel		Yes
256 data memory		Yes
Hardness conversion		Possible in compliance with ASTM (E-140),JIS
OK/NG criteria		Yes
Data editing		Yes
Data output		RS232C
Accuracy		According to ASTM E-384, ISO 6507-2 and JIS B 7734
Photographic equipment		Possible to retrofit (camera sleeve: optional)
Dimensions		Main body only: W220xD400xH500
Weight		28 kg
Power supply		Single phase AC100~240V 50/60Hz available

Applicable accessories

Standard	**DM-8 A and B**
- Manual X-Y stage (Built in)	1
- Precision vice	1
- Standard test block (HMV700)	1
- Diamond indenter for HV (Built in)	1
- Measuring microscope (with x10 Eyepiece)	1
- Object lens (Built in) x10	1
- Object lens (Built in) x40	1
- Level adjusting leg	4
- Light source bulb (12V 18W)	2
- Fuse 100~240V 2A	2
- Fuse 200~240V 2A	2
- Power cord (3P-2.5m)	1
- Auxiliary tools	1 set
- Instruction manual	1
- Accessories box	1
- Printer	-

Optional
- Knoop indenter
- Knoop test block
- Printer
- Motorised X-Y table connected with CNC computer for automatic tests (optional)

TAURUS 5

Easy to use software and camera Auto measure Vickers+ Manual Vickers

SOFTWARE FOR QUICK MEASUREMENTS FM20A04 PROCEDURE LEVEL 1

SOFTWARE FOR AUTOMEASURE, FM20A10 PROCEDURE LEVEL 1

SOFTWARE FOR AUTOMATIC X-Y TABLE, QUICK MEASUREMENTS, LEVEL II

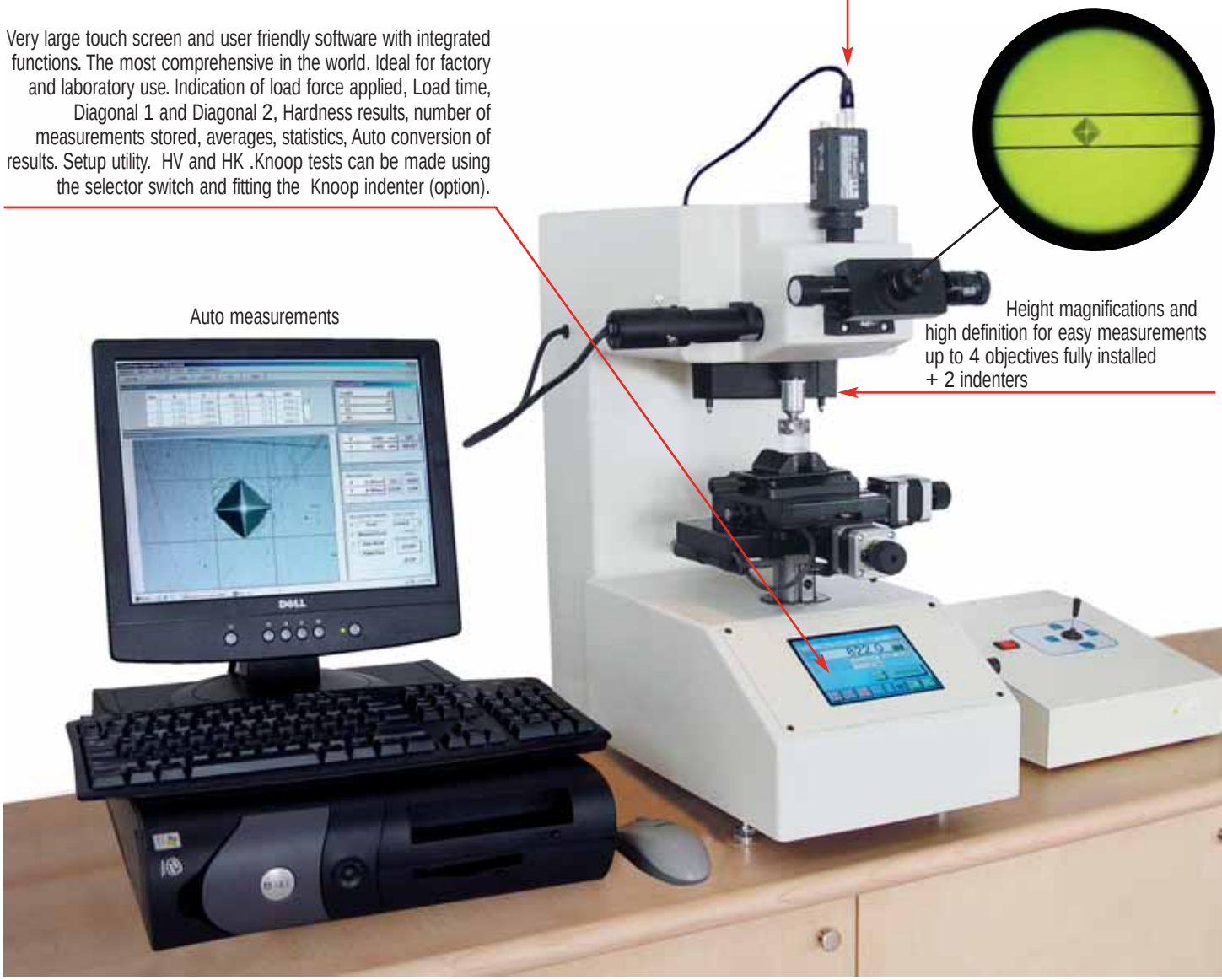
FULLY AUTOMATIC SYSTEM

For more information refer to catalogue 03.01-DM-8

- *Digital micro hardness tester*
- *Auto turret 6 steps (2 indenters + 4 objectives)*
- *Touch screen*
- *100x - 400x magnification*
- *Auto measurements (DM-8 Auto)*
- *Load range 1gf to 2000gf (DM-8B)*

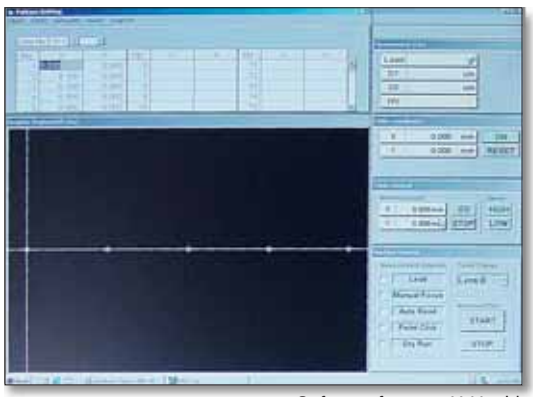
CCD camera transmits the image to the computer and AFFRI EASYDUR® Software for fast and automatic Vickers measurements eliminating human error, storing data, performing statistics and printing out results (only for DM-8 Auto).

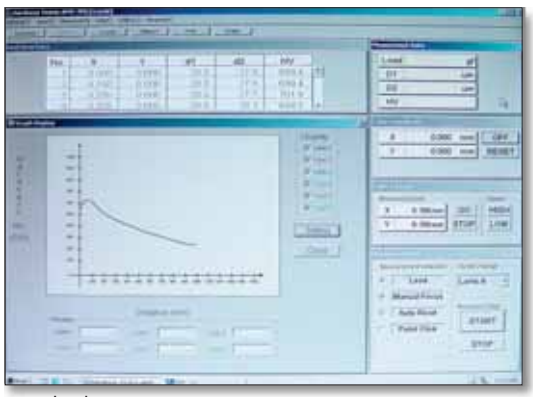
Very large touch screen and user friendly software with integrated functions. The most comprehensive in the world. Ideal for factory and laboratory use. Indication of load force applied, Load time, Diagonal 1 and Diagonal 2, Hardness results, number of measurements stored, averages, statistics, Auto conversion of results. Setup utility. HV and HK .Knoop tests can be made using the selector switch and fitting the Knoop indenter (option).



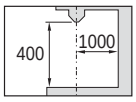
Auto measurements

Height magnifications and high definition for easy measurements up to 4 objectives fully installed + 2 indenters





Software for auto X-Y table for case depth measurements



SPECIAL MODELS

This hardness tester is endowed with movement on 3 independent axes and rotation of 360° to allow an easy location of the testing point.
Perfect and effective measurements including the first test.

SLIM INDENTER

Single initiation to operate the movement for test preparation and for the entire test cycle performance, including the piece clamping phase. Ensures that every result is correct including the first. This increases the repeatability of the machine giving test accuracy and reading reliability.
Tests can be performed during the manufacturing process, so that the annealing oven personnel can be informed about the test result in real time.
The output quality can be increased without any added cost.
Cost effective enabling quick write off in one year.

AUTO CONTACT WITH THE TEST PIECE

- Following initiation by the Start button, the MATRIX head moves down to reach the test surface and starts the continuous unbroken test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- Does not require elevating screws
- Meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.

Technical characteristics

Reading scales	HRC or HRN or HV Vickers
Reading division	0.1 HRC 0.1 HRN 0.1 HV
Reading	Digital, with memory
Data output	RS 232 C for connection to printer or computer
Setting	min. and max. tolerance limits
Test loads	kg 150 for HRC; kg 30 for HRN; kg 30 for HV
Accuracy	Conforms with standards EN-ISO 6508
Test time	5 second (adjustable)
Working Depth	1000 mm (others on request)
Working Height	400 mm (others on request)
Machine weight	800 kg ~
Power supply	220V 50÷60Hz - 200VA
Pneumatic pressure	4 BAR

Applicable accessories

- Software program to create drawings and statistics on the results
- 20 column printer

CE

For more information refer to catalogue 01.01-MATRIX

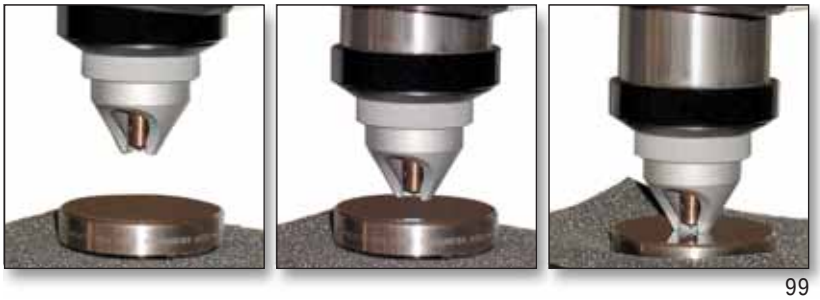
MATRIX CRANKSHAFT + CAMSHAFT TESTER MATRIX

MODULAR STRUCTURE
The machine is of modular construction so that it can easily accomodate different test pieces sizes.

EASY DISPLACEMENTS
All movements are on guides with leadscrews to ensure accurate and easy movement of the test head which accurately locates the different testing points on the crankshaft journals ,on the connecting rods and camshafts bearing surfaces.

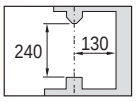
AUTOCENTERING
The accuracy of the automatic centering system guarantees precise and reliable location of the support carriage carrying the measuring head.

AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



LD 3000AF

BRINELL - VICKERS



SYSTEM AFFRI

The LD 3000 AF hardness tester is a very practical and strong instrument designed to perform Brinell hardness tests at 3000 kg and other loads starting from 10Kg and also to perform Vickers tests. The integral AFFRI system assures high performance using automatic selection and application of loads through a simple touch panel.
Digital readout of load force and dwell time help the operator during the test. The test force is closed loop controlled through an electronic load cell connected to the indenter. All errors linked to weight systems are eliminated, the test is fast and there is an absolute increase in accuracy in every condition.
It includes a clamping cap for secure stability of large parts. The indenter moves through 30 mm into auto contact with the sample.
The operator is required only to push the twin start buttons to initiate the complete test sequence: auto contact with the test surface ,clamping, application of the test loads, release of sample. At the end of the cycle, the operator can easily measure the indentation in different systems:

Four different measurement systems

- **Through the microscope** we supply, in order to obtain Brinell Vickers values (standard).
- **AUTOSCAN**, which is the electronic microscope for automatic measure (it is an option).
- **Integrated automatic measure**, without a microscope for fast and serial tests HBT system (option)
- **Integrated optical direct readout** through camera system and automatic Brinell.

It can be operated in areas subject to vibration.
No need to level.
It can work even if inclined.
It can be operated at different temperature ranges from 0 to 50°C.

Standard Equipment included in the price

Instruction manual, calibration certificate, dust cover, conversion table, warrantee certificate, electrical connection cable 220V50/60Hz.
0.01 mm high resolution microscope with 6 mm drum scale for Vickers Brinell indentations

Optional: **Easy Brinell**
(Automatic Optical measure through autoscan Probe)

Optional accessory: Clamping base for large or unstable pieces

Automatic Brinell measure, for fast test on production department, it doesn't need any microscope

Technical characteristics

Programmed test force through touch panel and closed loop and load cell inside:

BRINELL loads:	98.1- 147-294-306-613-1226-1839-2452-4905-7357-9810-29430 N (10-15-30-31.2-62.5-187.5-250-500-750-1000-3000 Kg)
VICKERS loads:	98.1 - 147 -294 - 490.5 - 981 N Vickers 10 - 15 - 30 - 50 - 100 Kg
Rockwell (on request)	60 100 150 (588 981 1471N)
Dwell Time forces	from 5 to 60 seconds programmable
Digital display	of the selected force, selected test time
Cycle	only one single start input including travel of indenter and self loading
Clamping	movable cup and adjustable clamping force up to 4000N
Measure	Through the microscope; Autoscan; Integrated automatic measure; Integrated optical direct readout
Field of use	all metals from 10 to 600 HB 10 to 2600 HV
Cycle sequence	With digital signals
Field of use	all metals from 10 to 600 HB
Test height	300 mm
Test width	160 mm
Instrument dimensions: 45 x 70 x 90 h cm	
Weight	350 kg

Extra accessories

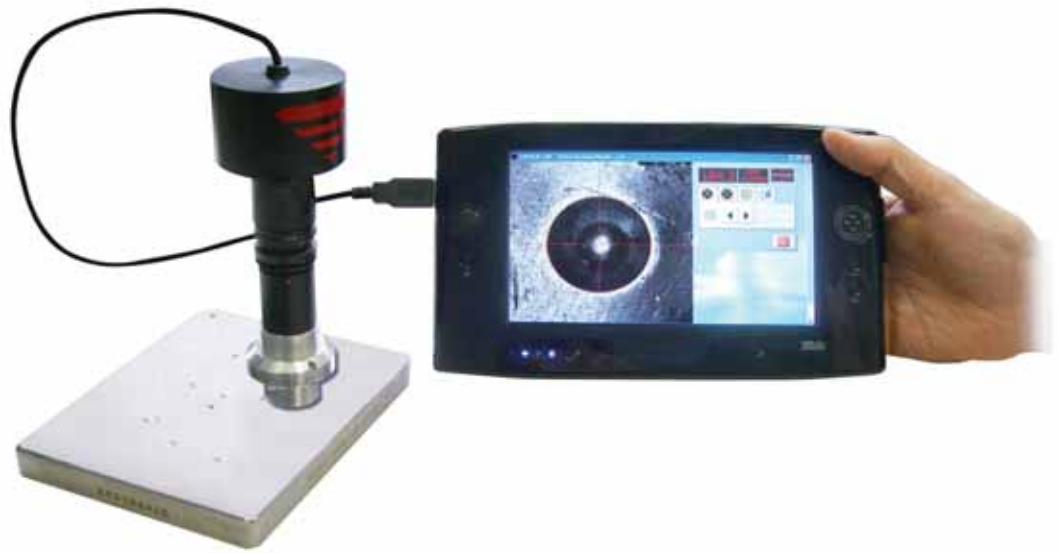
- Clamping base for secure lock samples
- Big flat anvil 150 mm
- Large square table 400 x 300
- Indenter 10 mm
- Indenter 5 mm
- Indenter 2.5 mm
- HRC indenter; HRB Indenter
- Flat anvil 60 mm diameter for medium pieces
- "V" anvil 60 mm diameter for round pieces
- Test block HB W - 3000 Kg
- Test block HB W - 750 Kg
- Test block HB W - 187.5 Kg
- HRC test block; HRB Test block
- Vickers 136° Indenter
- Vickers Test block HV 30
- Automeasure
- Automatic HBT Brinell measure
- Easy Brinell
- Integrated screen automeasure
- Autofocus
- Integrated screen and automatic Brinell measure
- Using camera and software for fast and automatic Brinell and Vickers measurements
- Objective 20x for load 187.5 - 250
- Objective 44x for load 30 - 187.5
- Objective 70x for loads 10 - 30

For more information refer to catalogue 00.01-LD3000

EASY BRINELL

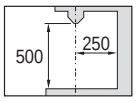
- It is an automatic microscope with camera which sees and measures indentations and shows the Brinell results automatically
- The Auto Scan Brinell microscope measures the indentations in a few seconds
- It has a digital electronic visual system eliminating operator eyestrain and providing more accurate results in a shorter time
- The results can be saved and it is possible to print out a report
- It can be adapted to all types of Brinell instruments, to all test loads and to different ball indentations
- Ideal for production departments to eliminate subjective optical measurement errors.

Electronic microscope for automatic Brinell indentation measurement.
Ease of use:
Put the probe on the test piece and press button.
Brinell result will appear automatically.
Adaptable for all type of hardness testers.
Accurate +/- 0.5%
Auto light
Magnetic foot
Can be installed on any PC



- ***Automatic Brinell microscope***
- ***No more looking through a microscope***
- ***Very fast use***
- ***Automatic measurements***
- ***High Accuracy***
- ***Universal: it is adaptable to all Brinell indentations***

Technical characteristics	
Programmable for	ball 1 - 2.5 - 5 - 10 mm diameters loads 62.5 ÷ 3000 Kg
Division of readout	0.1 HB unit
Repetability	depends on surface roughness
Computer	minimum configuration Pentium 4, Windows 98 software, 4 Gb HD, 128 Mb Ram
Conversion table	inside
Weight of probe	0.5 Kg
Cable	2 meters



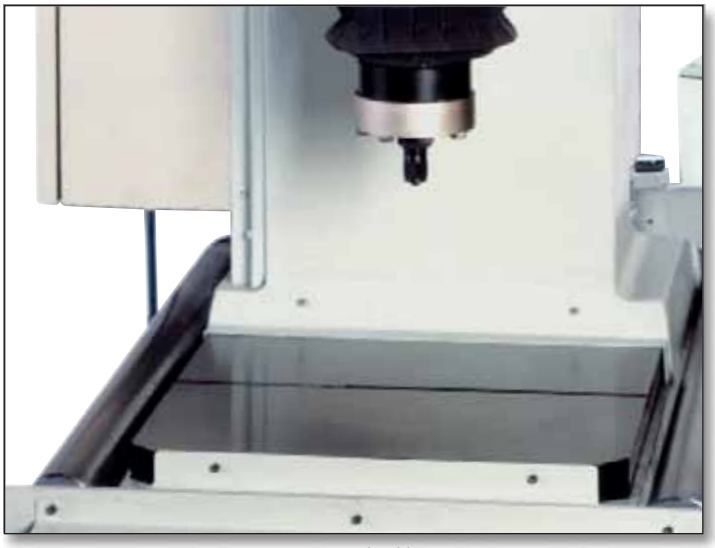
AUTOMATIC BRINELL

AUTOMATIC BRINELL

- CK 3000 is a fully automatic hardness tester
- It automatically measures HBT Brinell scale
- Adaptable for all kind of materials: Cast iron, brass, cooper, aluminium
- Doesn't require polished surface but automatically measure HBT
- The test time is in accordance with International Standards, it can be adjusted to end user requirements
- Can perform up to 1000 tests per hour
- The CK 3000 includes Affri® patented technology for automatic contact with the test surface; following a single initiation the indenter and measurement head moves down traversing the long 500 mm stroke to contact the test surface, perform the test and return to free the test sample. The digital measurement is shown on the display.
- It is very easy to integrate the CK 3000 into an automated line for rapid 100% testing of test pieces. It can be controlled by a PLC or other electrical input, and provides data output of test results.

For foundry - forging applications

Test on tube



Large work table

Technical characteristics

Digital read-out	HBWT-500 - HBWT-750 - HBWT-1000 - HBWT-3000
Test loads	4905 7357 9810 29430N
Total height capacity	500 mm - Other on request
Depth	250 mm - Other on request
Base	400 x 400 mm
Accuracy	Conforms with standards EN-ISO 6506
Power supply	220V 50÷60Hz - 200VA
Measures	80x100x200 cm
Weight	500 Kg

Applicable accessories

- Roll supportings for easy movement of big parts
- 10 mm ball indenter
- 5 mm ball indenter
- 2.5 mm ball indenter
- Brinell test block
- Auto Scanning Brinell Microscope

CE

For more information refer to catalogue 01.01-CK3000

SINGLE INITIATION OF COMPLETE OPERATION INCLUDING AUTO CONTACT WITH TEST PIECE ①

- Following initiation by the Start button, the CK3000 head moves down to reach the test surface as part of the continuous test sequence comprising:
  - approach to the piece;
  - clamping of the piece;
  - indentation;
  - complete measurement cycle and release of piece.
- It does not require elevating screws
- It meets all laboratory requirements
- Full operation even in presence of vibrations, sudden changes in temperature or dusty environments.

AUTOMATIC BRINELL HARDNESS TESTER

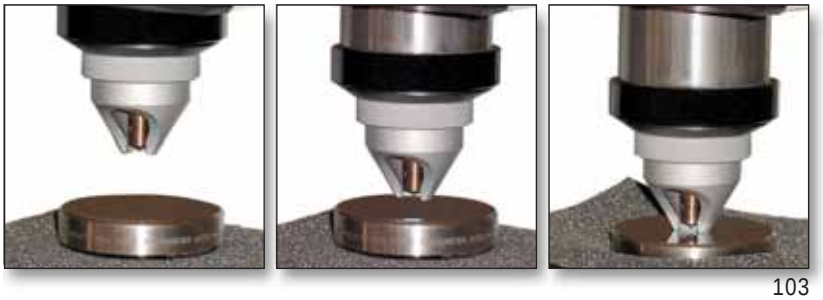
- Performs HBT measurements

ABSOLUTE MEASUREMENT

- The measurement is accurate including the first test and does not require a second test to confirm the result
- No difference of accuracy between stable and unstable test pieces
- Designed to test forging, cast iron and large components
- Does not require polished surface
- Does not require optical reading

Optional:
Roll supports for easy movement of large parts

① **AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE**



AUTO 3000

AUTOMATIC BRINELL

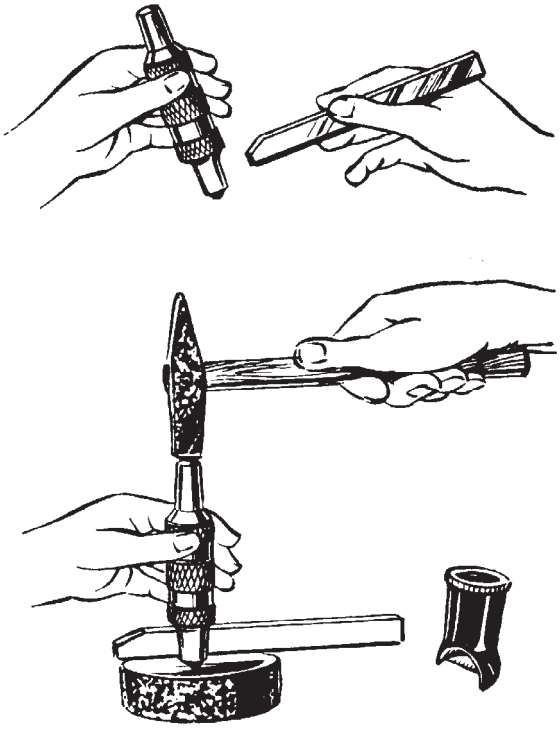
SYSTEM AFFRI

- *Automatic Brinell tester*
- *Digital Brinell read-out*
- *Test load automatically programmable (4900-7350-9800-29400 N)*
- *Ball indenter 5-10 mm*
- *The head rotates 360°, slides to facilitate clamping of the test piece and automatically executes the Brinell test (HBT)*

AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE

For more information refer to catalogue 01.01-AUTO3000

- *The indentation is created following a single hammer blow on the probe.*
- *A great tool for very simple and easy Brinell tests*
- *Large forged and cast iron parts can be checked in 5 seconds*
- *Very economic*



Technical characteristics (code 5001)

BASIC CONFIGURATION:
- Probe with ball indenter 10 mm
- Calibrated test block
- Eyepiece with micrometric scale
- Table for immediate Brinell values on cast iron, carbon steel

HOW TO OPERATE:
- Introduce the test block on the probe hole
- Place the probe on polished test surface
- Strike the top of the probe with the hammer
- Read the indentation on test piece and test block and convert indentations to Brinell values using the tables

Applicable accessories

- Microscope 1216 for more accurate readout of indentations, SET of 10 test blocks

Field of application for AFFRI® Microtester

	< soft ..... hard >	
HRA - Rockwell A	20 – 92	For hard steel, nitriding, cementation, roller, steel for tools, soft and hard materials
HK - Knoop	25 – 97	For soft steel, non ferrous metals
HRC - Rockwell C	0 – 80	For hard steel, nitriding, cementation, roller, steel for tools
HRB - Rockwell B	26 – 100	For soft steel, non ferrous metals
HR30T - Rockwell 30T	16 – 83	For soft steel, non ferrous metals
HB5 - Brinell 5	5 – 205	For aluminium, soft aluminium alloy cast iron, bronze, brass
HB30 - Brinell 30	66 – 884	For heat treated steel, annealed steel, drawn products, deep-drawn strip
HV - Vickers	13 – 1865	For all material
R - Tensile module N/mm^2	226 – 2898	For heat treated steel, annealed steel, drawn products, deep-drawn strip
HR15N - Rockwell HR15N	69 – 93	For hard steel, nitriding, cementation, roller, steel for tools

QUICK: in only 2 seconds the hardness and sigma are measured on large range of metallic products

UNIVERSAL: designed to check sheets, metal rolls, shaped parts, tubes, on aluminium, brass, copper and steel

ACCURATE: products and surfaces down to 0.08 mm thick can be checked. It works using the innovative Affri system which measures the real indentation depth applying constant incremental load rates through a minor and major load (as in laboratory machines).

MULTISCALE: 6 differents scales can be easy converted without repeating the test: HRC, HRB, HB-5, HB-30, HR15N, HV Rmm sigma

Technical characteristics

Height capacity	self adjustable from 0.08 to15 mm (other measures on request)
Reading scales	Rockwell HRC HRB HB5 HB30 HR15N Sigma full included
Depth capacity	25 mm
Power	battery
Memory	Type B: 500 data+ statistic, RS 232C out-data for printer or PC connection

Applicable accessories

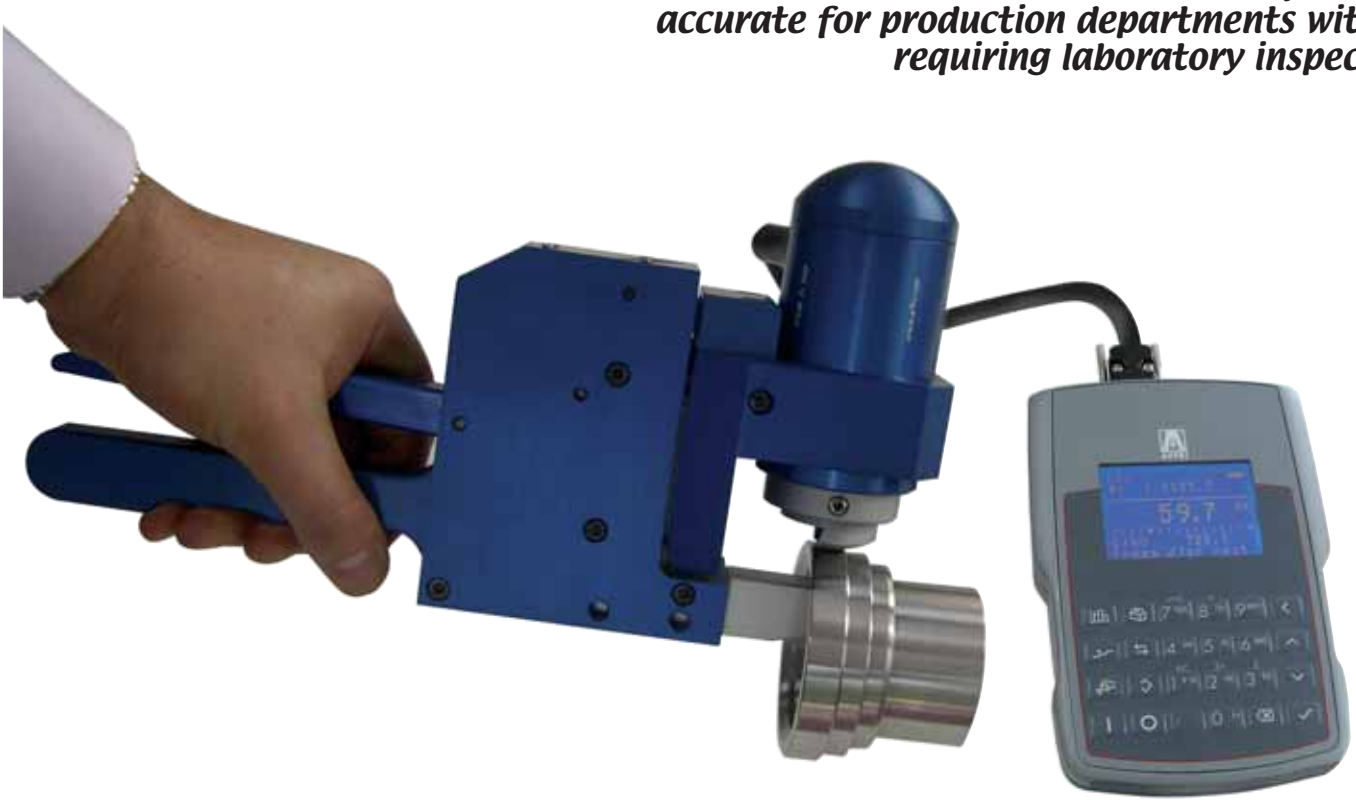
Standard

- Bag with instrument, test block, instruction for use

Extra

- Printer with cable only for B model and
- Special bases for special fixtures

A new combined tester for Hardness and sigma break tests in one instrument: quick and accurate for production departments without requiring laboratory inspection.



- *An invaluable help in the warehouse or factory*
- *Tests hardness on all type of metals*
- *Tests the break module sigma*
- *Does not require adjustment*
- *Ready for test in any moment*
- *6 different conversion scales*
- *Stores results*
- *Statistics and data output for printer or PC connection*
- *Acoustic signal*

Field of application for AFFRI® Microtester

	soft ..... hard	
HRA - Rockwell A	20 – 92	For hard steel, nitriding, cementation, roller, steel for tools, soft and hard materials
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HR15N - Rockwell HR15N	69 – 93	For hard steel, nitriding, cementation, roller, steel for tools

WHEN PORTABILITY AND DEPENDABILITY COUNT...

The METALTESTER portable hardness tester provides quick and accurate measurement of Rockwell, Brinell or Vickers hardness values anywhere in, or outside your manufacturing facilities. The METALTESTER can be used to test most metals including: chrome plating, nitrided surfaces, aluminium, brass, copper, bronze, and hard or soft steels regardless of thickness. A diamond indenter assures accurate hardness readings on all surfaces. Three interchangeable test heads enable the user to perform tests on a variety of different shaped samples or finished parts. A stand is available to facilitate testing of small, and difficult to handle parts. The light weight and compact size of the METALTESTER makes it an extremely effective hardness tester for use on any surface of large, cumbersome samples or manufactured parts.

The narrow, extended head is ideal for measuring hard to reach surface such as the inside of castings, finished housing, or machined surfaces. Simply select the desired hardness scale and then place nose of the test head on the test surface and apply a small amount of pressure to apply the test load. When the audio signal is heard, the test is completed and the results instantaneously displayed. The METALTESTER is now ready for use again. It's that easy.

Applicable accessories

Standard
- Hardness test unit
- Diamond indenter
- RS-232 output
- Rugged carrying case
- Bases foot

On request
- Art. 2312 - Stand support with anvils
- Art. 23631 - Clamping hand wheel
- Art. 23630 - Printer
- Art. 2315 three point base for irregular surface and large round pieces.
- Art. 2316 support to perform tests on extrusion screws
- Cable for PC connection

Technical characteristics

Min. thickness measurable	Mod 2102= 0.14mm Mod 2102-2=0.08 mm at 65HRC
Principle of operation	Load with electronic control
Fields of application	for all metals
Digital scale read out (other scales on request)	Rockwell HRA (20...92); HRB (26...100); HRC (0...80); HR15N (69...93); HR30T (16...83) Brinell HB5 (5.. .205); HB30 (66...884) Knoop (25...97) Vickers (13...1865) Tensile Module R (226.. .2898) HZA (0...250) Webster B 0 – 20 (on request) Barcol 0 – 100 (on request)
Display resolution	0.1 HRC
Repeatability	± 0.5% on reference test block HRC
Memory of test results	500 tests
Data transmission	RS 232 C
Statistic of results	mean of resulfs
Display	L C D
Printer: portable 20 column termic paper rechargeable battery measures: (15 x 10 x 4 cm)	
Power supply	rechargeable battery 6V
Operating time	1000 tests
Automatic shut off	After a pause of 2 minutes. Restart by button
Dimension of probe	body: ø 40 mm x 90 mm - base ø 20 min.
Dimension of electronic box	160 x 90 x 50h mm
Weight	300 gr. probe - 980 gr. digital box - 2.5 Kg with case
Dimension of case	30x20x15 cm

Optional: Art. 2315
For irregular surfaces

Extension probe

Large LCD display and user friendly keypad make the metaltester easy to operate

Cod. 2312 stand with anvils with stand mounted unit, the METALTESTER is ideal for testing small samples

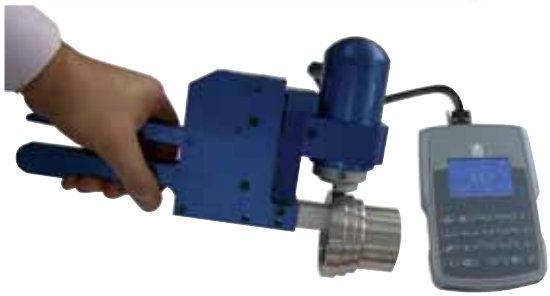
FOR THIN SURFACES

THICKNESSES DOWN TO 0.08 mm AND LARGE PARTS

Interchangeable test heads are designed for a wide range of metal applications and surfaces.

Easy test on thin parts and flexible pieces

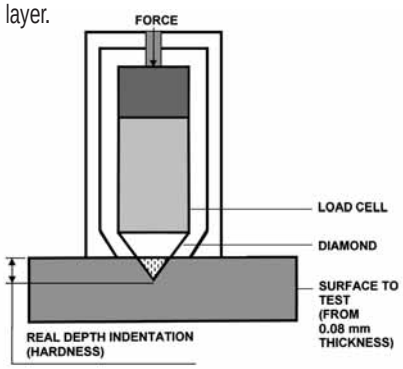
Easily tests even inclining the probe



Cod. 23631 Handclamp for thin parts (optional)

FUNCTIONING PRINCIPLE:

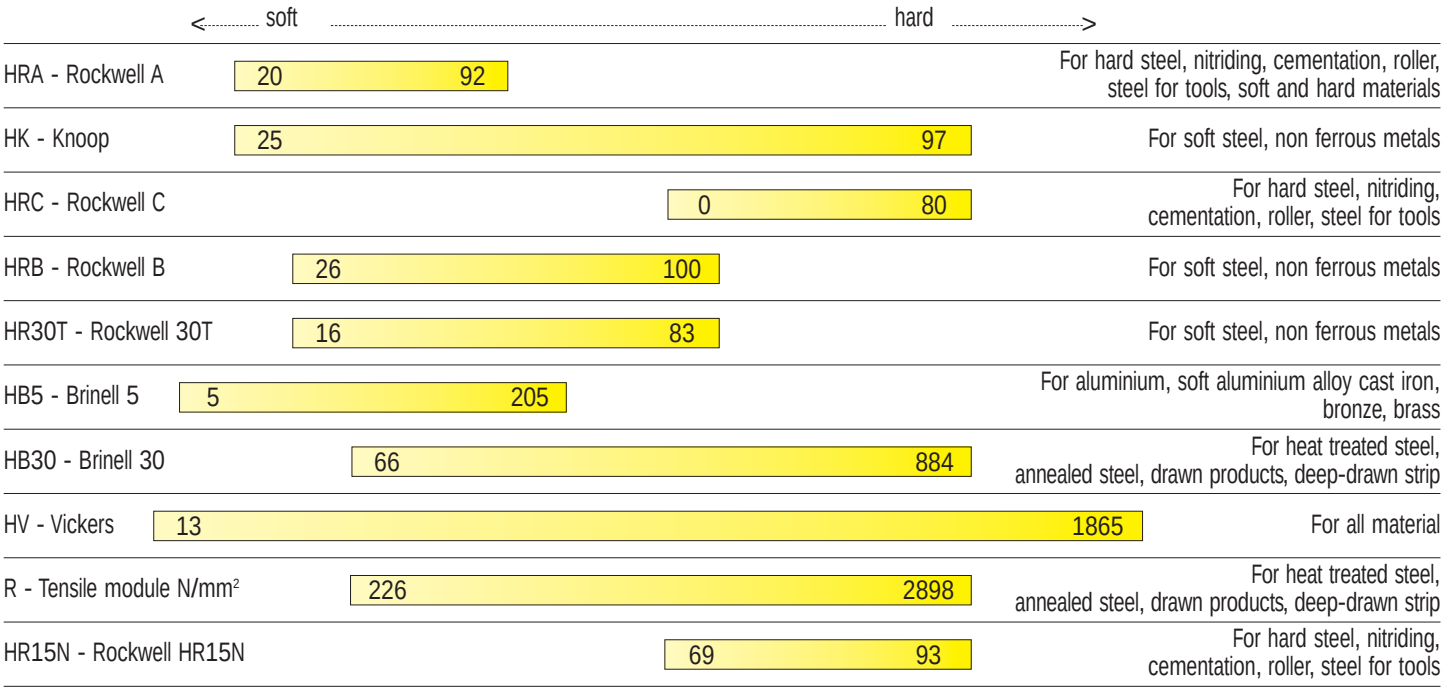
The difference in displacement during indentation of an electronically loaded and controlled diamond point (with an initial minor force and a final major force) determines the hardness scale of the tested metal layer.



Bag with all accessories standard + (Printer otional)

Transportable bag

Field of application for AFFRI® Metaltest



Technical characteristics

AFFRI -METALTEST is a portable Rockwell Hardness tester with HRC direct digital read-out and conversion to other scales through table included. It is designed for hardness tests on particularly cumbersome items, materials in the warehouse, and pieces which cannot be tested on a bench Hardness Tester. Very thin metal such as shearing bands, surfaces in hardened metal such as superficial hardness starting from a thickness of 0.08 mm. It does not spoil the surface because it produces micro-indentations.

- It works on the Rockwell principle, with preload and load.
- There is automatic zeroing and memory of last result.
- Very light and compact with microprocessor incorporated; liquid crystal, digital display indicating the hardness value which is fixed and memorized on the display until the next test, allowing tests to be done even where there is little light.
- It is child's play to use it: just place the hardness tester on the surface to be examined and press the handgrip right down; release the pressure, the piece hardness immediately appears on the display.
- It runs off one 9 Volt battery, which should last for 2.000 tests.
- The penetrator is a diamond cone.
- It is supplied with a calibrated reference specimen.
- Measures 16x16x12 cm.; weight: Kg. 1.2

PERFECT AND EFFECTIVE MEASUREMENTS INCLUDING THE FIRST TEST

Applicable accessories

Standard

- Diamond indenter
- HRC test block
- Adjustable base for test on flat and round pieces up to Ø 200 mm.
- Tables and instructions sheet for use
- Supplied with certificates on SIT primary samples.

Extra

- Art. 2310 large "V" support for round surfaces with more than Ø 200 mm.
- Art. 2312 stand support with a series of anvils for test on small pieces
  working opening mm. 100
  working depth mm. 65
- Art. 2315 three points base for irregular surfaces and large round pieces.
- Art. 2316 support to perform tests on extrusion screws
- Art. 23631 Handclamp

Optional: Art. 2315
For irregular surfaces Coils

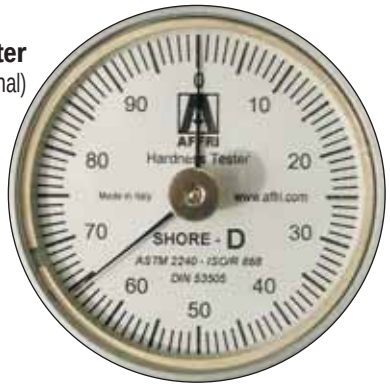
Optional: Art. 2316 V long base
Easy test on long screws

For more information refer to catalogue 01.01-METALTEST

- *For every kind of metal both very hard and soft*
- *Suitable for flat, round and irregular pieces*
- *No need for adjustment*
- *Accuracy ±1HRC*
- *For thin surfaces: down to 0.08 mm thickness and large parts*

Portable hardness tester compact and easy to use in every position with immediate display of HRC, HRB, HRA, HB, HV, N/mm2, HR 15N units
No limit on thickness that can be tested, coating materials of 0.08 mm thickness can be measured accurately.

Second pointer
to memorise the measurement (optional)



HARDNESS TESTER

In compliance with ASTM 2240, ISO R.868, DIN 53505, JIS K7215 specifications. For rubber, plastic, medical components, paper, sponges using Shore A, B, C, D, O, OO, E, M, 000, 000-S scales.

With slim nose to ensure exact measurement even on small components.
For laboratory use connect it with bench stand 13.

Type	Fields of application
3001 - Shore **A**	- For soft, flexible rubber, plastic, PVC, polyester, neoprene, leather, thiokol, nitril rubbers, tyres, etc.
3011 - Shore **B**	- As A scale for high values
3004 - Shore **C**	- As D scale for low values
3002 - Shore **D**	- Scale for hard and rigid surfaces synthetic materials, acrilics, plexiglass, printing rolls, cellulose, acetates, densified wood, nylon, derling
3010 - Shore **DO**	- As B and C
3009 - Shore **O**	- As A scale for low values
3008 - Shore **OO**	- For sponges, natural rubber and silicon
3013 - Shore **E**	- ASTM D 2240 - 02 a
3014 - Shore **M**	- ASTM D 2240 - 02 a
3015 - Shore **000**	- ASTM D 2240 - 02 a
3016 - Shore **000-S**	- ASTM D 2240 - 02 a

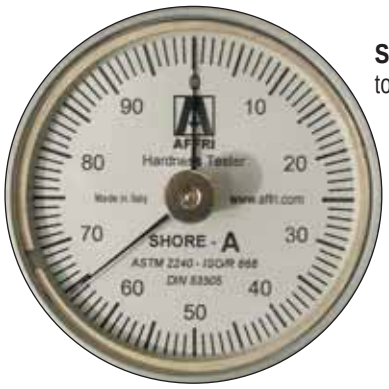
Accessories

ART 13
Bench stand for use with analog or digital portable units, ensures exact , centered use of the unit on test samples with constant pressure.

ART 14
Supplementary weight for Shore C - D - DO models.

ART 16
Set of clamping holders for bench connection in compliance with ASTM 1414 for precise O-Ring testing (section Ø 1.72 - 2.54 - 3.43 - 5.21 - 6.83 mm)

PORTABLE AND LABORATORY SHORE



Second pointer
to memorise the measurement (optional)

3003 Shore A
With clamping and automatic load

HARDNESS TESTER
In compliance with ASTM 2240, ISO R.868, DIN 53505, JIS K7215 specifications. For rubber, plastic, medical components, paper, sponges using Shore A scale.

Easy to use, supplied with clamping system to apply a constant and centered pressure on any sample, even on curved surfaces, assuring accurate results similar to those obtained through the test with bench support. Suitable for testing tyres, designed to test tyres, roll.

Type	Fields of application
3003 - Shore **A**	**-** For soft, flexible rubber, plastic, PVC, polyester, neoprene, leather, thiokol, nitril rubbers, tyres, etc.

Scale

soft ---------- hard

A			**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
B				**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
C					**10**		**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
D							**10**		**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
DO						**10**		**20**		**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
O					**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**			
OO	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**							

Indicative range for each scale (this cannot be used as a conversion reference)

Test blocks with certificate for each scale

- **Hardness Tester with electronic processor and interchangeable probes** for different scales:
- A, B, C, D, O, OO, E, M, 000, 000-S Micro Shore with automatic detection of the probe inserted and automatic calibration
- Designed to perform accurate and fast test on small parts and large parts and record data
- Very easy to operate : Push, read and store the result
- Special ergonomic probe, of Italian design, permits easy use in all situations, even inclined
- The probe, when using the special connector,with the motorised bench support DMG 03 allows automatic measurements in the laboratory.

FUNCTIONS:

- Measures at peak / at programmed times / Continuously
- Stores number of tests, automatic averages, list of stored results, statistic deviation diagram (when connected to a hard printer)
- Bat charge indicator and Bat shut off after 2 minutes not in use (saving data)

ART 16 - Set of clamping holders for bench connection in compliance with ASTM 1414 for precise test O-Ring (section Ø 1.72 - 2.54 - 3.43 - 5.21 - 6.83 mm)

ART DMG03
Motorised Bench support - Height capacity 75 mm

ART 13 - Manual bench support

Scale

| | soft - - -

ELECTRONIC HARDNESS TESTER

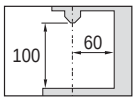
- ***Portable Hardness Tester with electronic processor and interchangeable Probes***
- ***For different scales in compliance with the standard according to Shore A, B, C, D, 0, 00, E, M, 000, 000-S Micro***
- ***Standard ASTM 2240, ISO R.868, DIN 53505, JIS K7215***

Handclamp

Art. A078.A1.080
MICRO PROBE A SCALE
for easy tests on interior surfaces

Complete Kit in case Including printer

Art. A078.A1.080
MICRO PROBE A SCALE

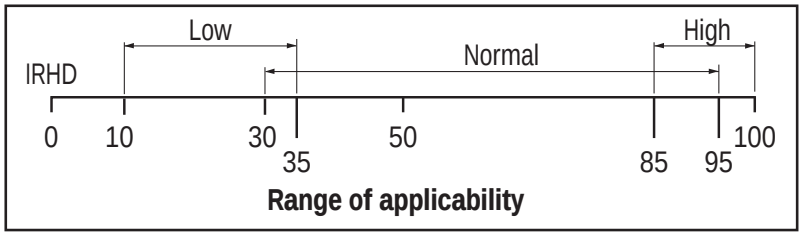


IRHD - MICRO IRHD (ISO 48) SHORE - For rubber, vulcanized or thermoplastics - Determination of hardness

This instrument includes four methods for the determination of the hardness of vulcanized or thermoplastic rubber on flat surfaces.

Method N Normal test
Method H High-hardness test
Method L Low-hardness test
Method M Microtest

and four methods for the determination of apparent hardness of curved surfaces using methods N, H, L and M, respectively:
Methods CN, CH, CL and CM



The methods differ primarily in the diameter of the indenting ball and the magnitude of the indenting force, these being chosen to suit the particular application. The range of applicability of each is indicated in figure 1.

Method N: the normal test for hardness is the appropriate method for pieces of thickness greater than or equal to 4 mm and is preferably used for rubbers in the range 35 IRHD to 85 IRHD but may be used for those in the range 30 IRHD to 95 IRHD

Method H: the appropriate method for test pieces of thickness greater than or equal to 4 mm and hardness in the range 85 IRHD to 100 IRHD

Method L: the appropriate method for test pieces of thickness greater than or equal to 6 mm and hardness in the range 10 IRHD to 35 IRHD
Note: The value of hardness obtained by method N within the ranges 85 IRHD to 95 IRHD and 30 IRHD to 35 IRHD may not agree precisely with that obtained using method H or method L respectively. The difference is not normally significant for technical purposes.

Method M: the microtest for hardness is essentially a downscaled version of the normal test method N, permitting the testing of thinner and smaller test pieces. It is the appropriate method for test pieces of thickness less than 4 mm and is preferably used for rubbers in the range 35 IRHD to 85 IRHD but may be used for those in the range 30 IRHD to 95 IRHD.

Shore: A - B - C - D

Principle

The hardness test consists in measuring the difference between the depths of indentation of a ball into the rubber under a small contact force and a large total force. From this difference, multiplied when using the microtest by the scale factor 6, the hardness in international rubber hardness degrees (IRHD) is obtained by using table or on graphs based on these tables or a scale. These tables and curves are derived from the empirical relationship between indentation depth and hardness.

Forces and dimensions of apparatus

TEST	Diameters (mm)	Contact (N)	Force on ball indenting (N)	Total (N)	Force on foot (N)
Method N (normal test)	Ball 2.50 ± 0.01 Foot 20 ± 1 Hole 6 ± 1	0.30 ± 0.02	5.40 ± 0.01	5.70 ± 0.03	8.3 ± 1.5
Method H (high hardness)	Ball 1.00 ± 0.01 Foot 20 ± 1 Hole 6 ± 1	0.30 ± 0.02	5.40 ± 0.01	5.70 ± 0.03	8.3 ± 1.5
Method L (low hardness)	Ball 5.00 ± 0.01 Foot 22 ± 1 Hole 10 ± 1	0.30 ± 0.02	5.40 ± 0.01	5.70 ± 0.03	8.3 ± 1.5
Method M (microtest)	Ball 0.395 ± 0.005 Foot 3.35 ± 0.15 Hole 1.00 ± 0.15	8.3 ± 0.5 (mN)	145 ± 0.5 (mN)	153.3 ± 1.0 (mN)	235 ± 30 (mN)

Technical characteristics

Working	motorised through load cell closed loop computer control 17" Colour LCD display
Conforms with the Standards ISO 48 / 7318 / ASTM 1415	
Stroke: 50 mm for autocontact with sample surface to a max of 200 mm	
Depth	170 mm
Base for sample	60 mm interchangeable
Dimension of machine	60 x 30 x 80h cm
Weight	60 Kg
Output data	USB
Power	220 /240 V 15V upon request
Packing measures	100x 100 x 100h cm
G.W.	90 Kg

Applicable accessories

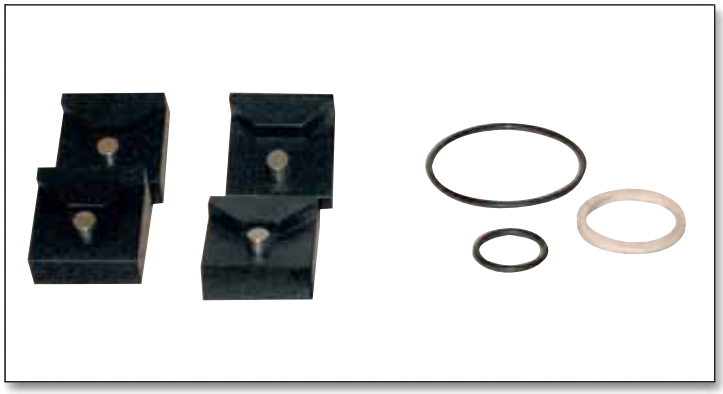
- Art. 16 set of clamping parts to test sizes of O.RINGS from 1.41 TO 6.33 section diameter
- Special vice 25 mm capacity for difficult pieces
- Indenter for N
- Indenter for H
- Indenter for L
- Indenter for M
- Test block N-H-L-M
- Model (A) IRHD
- Model (B) IRHD+M

Shore

Digital Unit for Shore readout

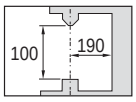
- A078.A1.010 Probe SHORE A with tungsten carbide indenter
- A078.A1.020 Probe SHORE B with tungsten carbide indenter
- A078.A1.030 Probe SHORE C with tungsten carbide indenter
- A078.A1.040 Probe SHORE D with tungsten carbide indenter

- *Motorised*
- *IRHD N-H-L-M*
- *Shore*



ART 16
Set of clamping holders for bench connection in compliance with ASTM 1414 for precisely testing O-Rings
(section Ø 1.72 - 2.54 - 3.43 - 5.21 - 6.83 mm)

SYSTEM AFFRI



FOR PLASTIC MATERIALS

The model 150 PLAST, is based on the Rockwell principle. It is recommended for testing plastic and thermosetting materials, according to UNI 4278 and ASTM D 785. The instrument can test hardened steel bronze and other metals in Rockwell scales. The depth penetration has been enlarged when compared with the other hardness testers and the Rockwell scale has been amplified and denominated ROCKWELL ALPHA.
It utilises a spiral on a delicate mechanic comparator and it is divided in 100 negative ALPHA points for testing soft materials; 150 positive ALPHA points; 25 points for testing the elastic deflection of the frame and the usual 130 Rockwell B points.
- The preload of 10 Kg is applied by the contact penetrator.
- Manual zero setting obtained by turning the dial gauge.
- Test load applied and removed by a lateral lever.
- Direct reading on the comparator.

The hardness tester 150 PLAST is provided with a variable load device and by combining the various indenters the following tests can be realised:

Rockwell scale	Indenter	(force Kg)	force N
HRB	ball Ø 1/16”	100	980
HRF	ball Ø 1/16”	60	588
HRE	ball Ø 1/8”	100	980
HRH	ball Ø 1/8”	60	588
HRL	ball Ø 1/4”	60	588
HRM	ball Ø 1/4”	100	980
HRR	ball Ø 1/2”	60	588
HRS	ball Ø 1/2”	100	980
HRα	ball Ø 1/2”	60	588

Technical characteristics

Preload	(10 kgf) 98.07 N
Test loads	(60-100 kgf) 588-980 N
Comparator	Mechanic with Rockwell and Rockwell ALPHA scale
Zero setting	Manual
Feasible tests	Rockwell (EN-ISO 6508) / ASTM D 785 Brinell (EN-ISO 6506)
Height capacity	100 mm
Depth capacity	190 mm
Reading resolution	0.5 HR
Net weight	75 kg
Packing weight	90 kg
Packing measurements	37x60x102 cm

Applicable accessories

Standard
1 ball indenter Ø 1/16”
1 ball indenter Ø 1/8”
1 ball indenter Ø 1/4”
1 ball indenter Ø 1/2”
1 HRB test block
1 Plane anvil
1 Dust cover
1 Wooden case
1 Instruction sheet
1 Rockwell ALPHA comparator

On request
- Vickers indenter 136°
- Rockwell indenter 120°

For more information refer to catalogue 01.01-150 PLAST

O.M.A.G.
BREVETTI
AFFRI
CE

Accessories

PJ for paper roll

- ***Portable tester for PJ tests on paper, roll paper and cardboard in accordance with P.J. procedure***
- ***Ball indenter included***
- ***Easy and immediate measurement with digital display***
- ***Can be utilised directly on paper roll due to the self aligning foot or on flat surfaces***

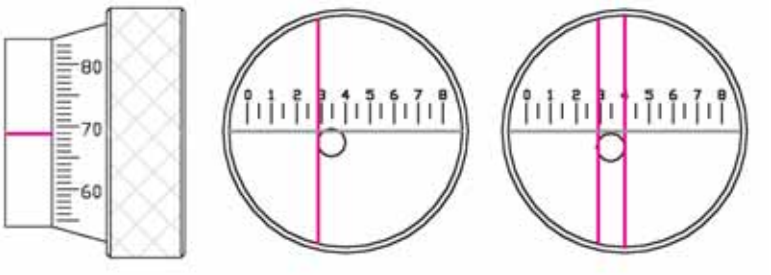
Technical characteristics

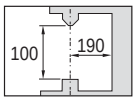
The hardness tester is composed of:
- Structure with open metal base to access the test sample, column to support the probe which is adjustable in height to accept samples of different sizes;
- Electric probe with digital read-out, resolution 0.01 mm., provided with printer connector.
- The base has adjustable feet and optical level for the levelling of the instrument; to test cylinders of different diameter especially gummed rolls.
- Handle to transport the instrument to execute tests of hardness directly on large pieces such as gummed rolls.

For more information refer to catalogue 01.01-IRHD PJ

1216 MICROSCOPE

- *Portable handy microscope*
- *The most accurate!!*
- *0.01 mm division - 20x magnification*
- *External scale for easy reading*
- *Eliminates eye strain*
- *Scale 6 mm division 0.01 mm*





SPECIAL TEST: HARDNESS TESTER FOR FOOD

MRS-FRU

- *Special tester for maturity and hardness verification of agricultural products, food and compression tests on packaging.*
- *With different indenters and special fixtures, it can be adapted for a large range of products.*

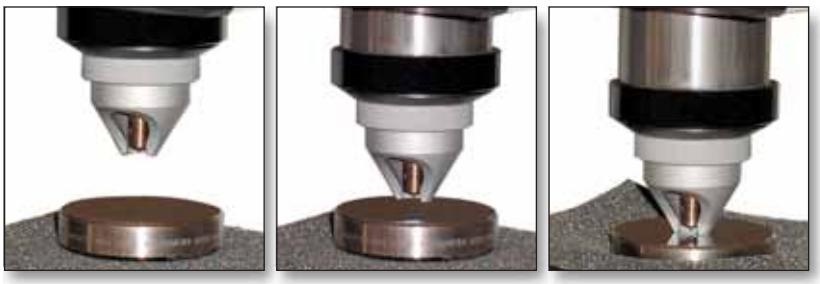
- *Production line with integrated automatic hardness tester for SKF.*
- *HRC scale, automatic loader, automatic test, automatic sorter: GO - high - low.*
- *1000 pcs per hour.*

AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE

Per tutte le informazioni necessarie chiedete il catalogo specifico 01.01-AUTOPRS

- *Automatic system for high speed hardness testing of steering components for G.M.*
- *On Rockwell Scale, automatic loader, automatic test, automatic sorter: GO - high - low.*
- *1500 pcs per hour.*

AUTO CONTACT WITH TEST PIECE AND AUTOMATIC TEST CYCLE



Per tutte le informazioni necessarie chiedete il catalogo specifico 01.01-AUTOGM

- *Examples of automatic feed input to the automatic hardness tester machines*

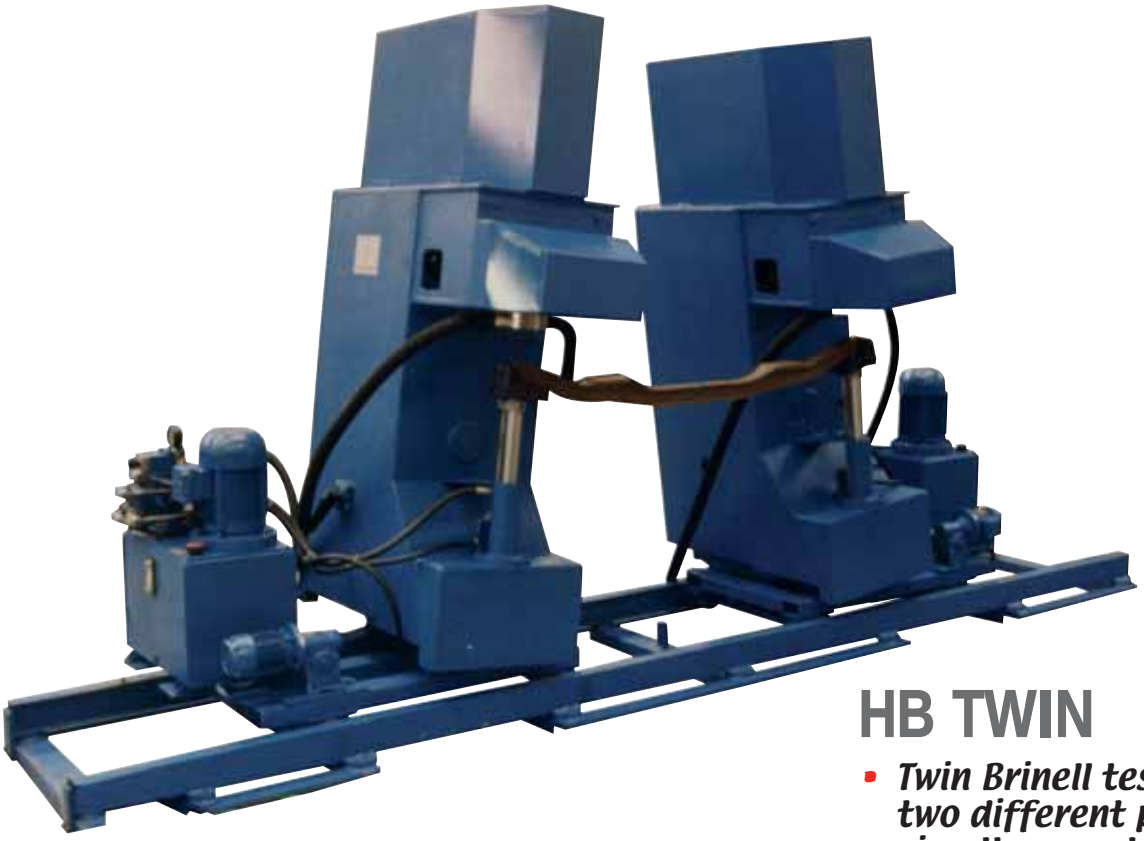
- *Special execution of hardness test HRC measurement during crankshaft production*

AUTO BRINELL- ROCKWELL

- *Automatic Brinell-Rockwell tester for tubes, bottles including: grinding of test area, indentation, automatic selection and automatic measurement of the test piece.*

AUTOMATIC BOLTS

- *Automatic high speed hardness tester for nuts, bolts, Rockwell C scale, automatic loader, automatic test, automatic sorter: GO - high - low.*
- *1000 pcs per hour.*



HB TWIN

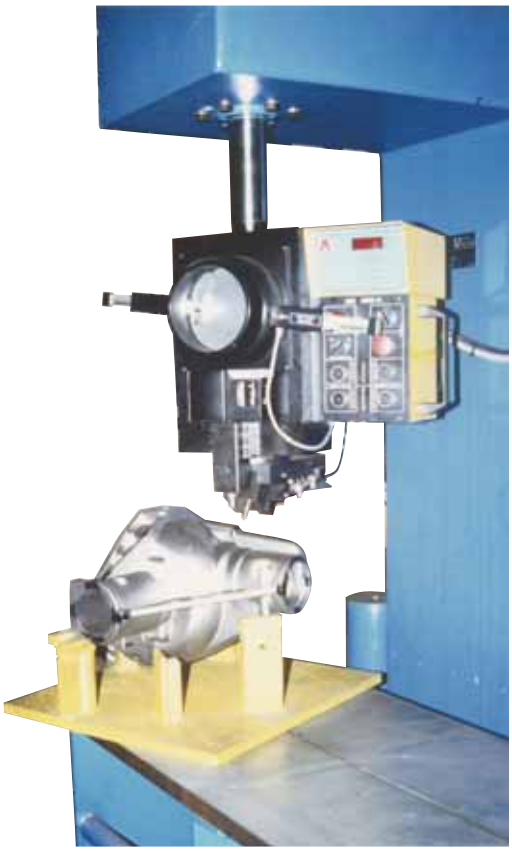
- *Twin Brinell test: measure in two different positions simultaneously with auto alignment HB 10.3000*

HB AUTO TUBE

- *Fully automatic system with grinding and Brinell automatic hardness test on cylinders, tubes and bottle, at high temperatures up to 350°.*
- *Load 2.5-187.5 / 10-3000 or Rockwell HRC.*
- *Automatic selection go/no-go*

HB OPTI

- *Brinell test on castings. Optical and digital Brinell display 10/3000 - 5/750 - 5/250*



METALTESTER F1

- *Vickers tests on crankshaft for Formula 1 (F1)*

3302 R

- *Equipped with sliding table on x-y axes and 360° rotation for test on crankshafts of scale HRC - HRN.*

Table to support hardness tester (code 13605)

Large machine support table (INTEGRAL 2 - 3332 series)

Special tools fixture

Sliding table X-Y programmable for Zig-Zag test

SOFTWARE LEVEL AND AUTOMATION APPLICABLE FOR VICKERS TESTERS, DM AND VRS SERIES

SIMPLE SOFTWARE AND CAMERA TAURUS 7. AUTO MEASURE VICKERS+ BRINELL

Camera 640 x 480 Pixels High definition B/W to see images with USB connection and specific software for immediate analysis of indentations and automatic measurement in Vickers units, manual measurements and case depth diagrams for Windows XP English. Supplied on CD. The use is straightforward: when the image appears on the screen it is automatically measured and the Vickers value will appear, if, however, it is not possibleto make an auto measurement, after touching the indentation corners with the mouse the Vickers result will appear on the screen.

FUNCTIONS AND CAPABILITIES:

Auto measure and Manual Measurement of Vickers+ Manual Brinell
Calculate circumference and diameter with 3 points
Perform case depth using X or Y table step increments
Create test file
Store data
Create case depth diagram
Create report data
Print out report data

SOFTWARE FOR QUICK MEASUREMENT FM20A04 PROCEDURE LEVEL 1

simply touch the corner of the indentation, and automatically the Vickersvalue appears, facilities to store data, create statistics, cp, cpk, standard deviation, case depth diagram, print report. Running on Win 2000 - XP with cameraadapter with C screw step to connect camera on the micro hardness tester independent from the eyepiece.

FM18D06 Frame Grabber FALCON
FM19A16 CCD Camera 1/ 2" PAL, C-Mount IRCut
FM16C 12 Cable –Camera to Frame Grabber ,UIB
FM19E15 Camera Power Supply 12V

SOFTWARE FOR AUTOMEASURE, FM20A10 PROCEDURE LEVEL 1

automatic scanning of indentation area, automatic presentation of the Vickers value, without operator intervention, possibility to store data, creates statistics, cp, cpk,standard deviation, case depth diagram, print report. Running on Win 2000 –XPwith Camera adapter with C screw step to connect camera on the microhardness tester independent from the eyepiece.

FM18D06 Frame Grabber FALCON
FM19A16 CCD Camera 1/ 2" PAL, C-Mount IRCut
FM16C 12 Cable –Camera to Frame Grabber ,UIB
FM19E15 Camera Power Supply 12V
Micrometer travel digital scale 0.01 mm digital read out + PC data output

SOFTWARE FOR AUTOMATIC X - Y TABLE, QUICK MEASURE, LEVEL II

FM20C15 Automatic X-Y- Stage 100 x100mm
Table with linear bearing guide 100 x 100 mm area with 2 Step motordriven automatic X-Y stage 50 x 50 mm div 0.01 mm step. Programmable computer controlled case depth measurements, drive test cycle, programmable for an automatic series of tests and auto measurement.

FM20C16 FM Stepper Box 3Axis for XY table
FM18D06 Frame Grabber Board FALCON
FM19A16 CCD Camera 1/ 2" PAL, C-Mount IRCut
FM16C12 Cable –camera to frame Grabber, UIB
FM19E15 Camera Power Supply 12V
FM20C14 Cable PC SER-FM Stepper Box
FM16E07 Stage Tsch Adapter
FM19A10 Tisch Adapter FV5mm

FULLY AUTOMATIC SYSTEM

Software for automatic X - Y table, auto-measure FM20A14
FM20C15 Automatic X-Y- Stage 100 x100mm
Table with linear bearing guide 100 x 100 mm area with 2 Step motordriven automatic X-Y stage 50 x 50 mm div 0.01 mm step. Programmable computer controlled case depth measurements, drive test cycle, programmable for an automatic series of tests and auto measurement.

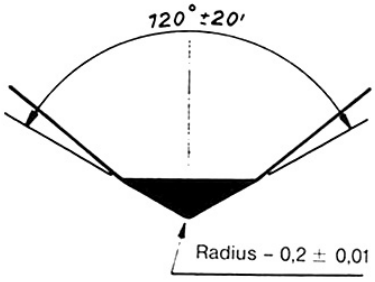
FM20C16 FM Stepper Box 3Axis
FM18D06 Frame Grabber Board FALCON
FM19A16 CCD Camera 1/ 2" PAL, C-Mount IRCut
FM16C12 Cable –camera to frame Grabber, UIB
FM19E15 Camera Power Supply 12V
FM20C14 Cable PC SER-FM Stepper Box
FM16E07 Stage Tisch Adapter
FM19A10 Tisch Adapter FV5mm
FM20C17 Z Axis for auto focus

NOTES (5x5 mm)

DIAMOND INDENTERS FOR EVERY TYPE OF HARDNESS TESTERS

Hardness Test Diamonds for Rockwell (Rc)

Nr.	Type	Testing appliance
11	Origin. Rockwell 120°	z.B. Frank
12	Testor 120°	Wolpert - Wilson - Time - Mitutoyo
13	Briro UVN 120°	Reicherter
14	Testor-Automat 120°	Wolpert



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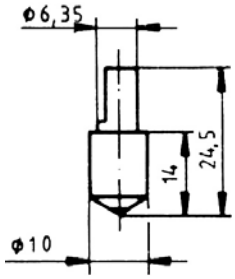

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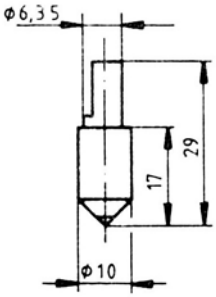

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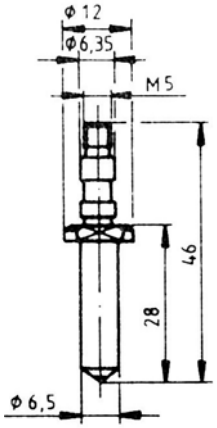

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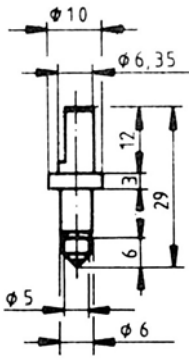
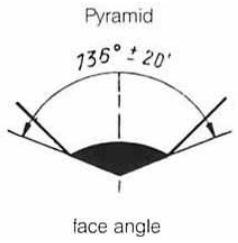


Hardness Test Diamonds for Vickers

Nr.	Type	Testing appliance
15	Origin. Vickers 136°	Vickers - Tukon
16	Vickers 136°	Frank
17	Dia-Testor 136°	Wolpert - Wilson - Time - Mitutoyo
18	Brivisor 3000H 136°	Reicherter
19	VHT 5 136°	Reicherter



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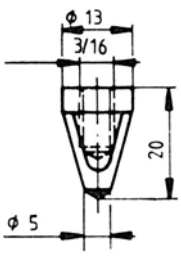

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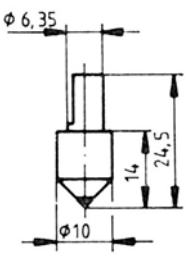

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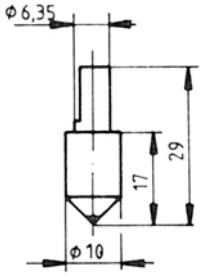

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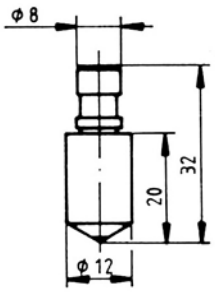

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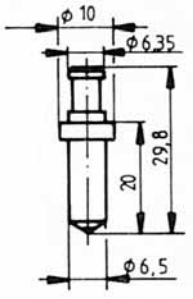
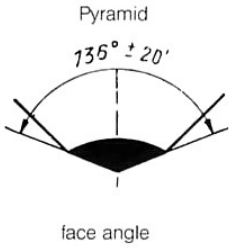


Hardness Test Diamonds for Vickers

Nr.	Type	Testing appliance
20	Zwick 1 136°	Zwick
21	Zwick 2 136°	Zwick
22	Briviskop 187.5 136°	Reicherter
23	Spare indenter for item 22	Reicherter
24	Testor-Automat 136°	Wolpert



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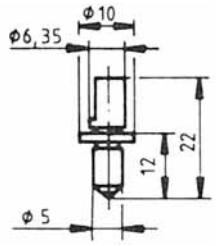
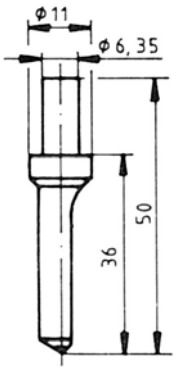


Nr. 21



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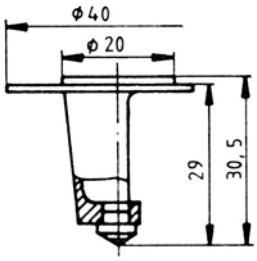

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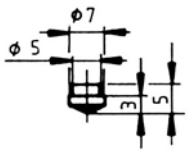

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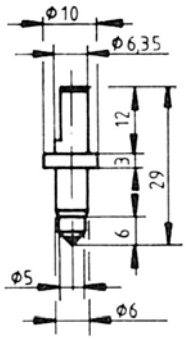
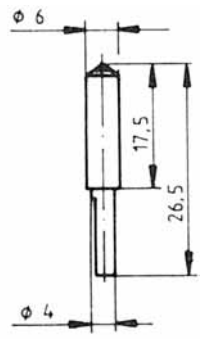


Diamonds for Micro hardness Test

Nr.	Type	Testing appliance
25	Mikro 136°	Leitz
26	Mikro-Testor 136°	Wolpert
27	Vickers 136°	Frank
28	Knoop	*

Nr. 25



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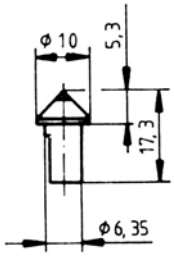
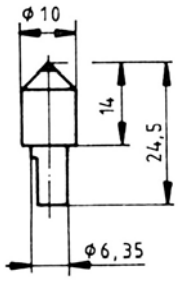


Nr. 27



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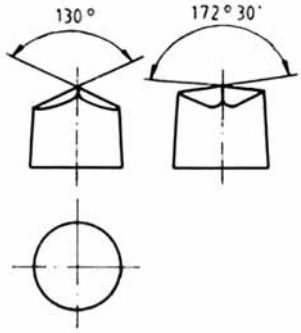

Shape of Knoop-Diamond

* Knoop-Diamond for all Testing Appliances

STANDARD TEST BLOCKS WITH UKAS - DKD CERTIFICATE FOR CALIBRATING HARDNESS TESTERS

TYPE	SCALE	NOMINAL VALUE	DIMENSION mm	SURFACE
Rockwell	HRC	20 25 30 35 40 45 50 55 60 63 65 67	Ø 64 x 15	Mirror
	HRB	30 40 50 60 70 80 85 90 95 100	Ø 64 x 15	Mirror
	HRA	26 31 35 40 45 50 53 55 59 62	Ø 64 x 15	Mirror
	HRA	60 63 65 68 70 73 76 78 81 83 84 85	Ø 64 x 15	Mirror
Available Rockwell HRD HRE HRF HRG HRH HRK HRL HRM HRP HRR HRS HRV scale				
Rockwell superf	HR15N	69 72 75 78 81 83 85 88 90 91 92 93	Ø 64 x 15	Mirror
	HR30N	41 46 50 55 59 64 68 73 77 80 82 83	Ø 64 x 15	Mirror
	HR45N	19 25 31 37 43 49 55 61 66 70 72 74	Ø 64 x 15	Mirror
	HR15T	70 73 77 80 83 86 88 90 91 93	Ø 64 x 15	Mirror
	HR30T	36 43 49 56 63 69 73 76 80 83	Ø 64 x 15	Mirror
	HR45T	2 12 22 32 43 53 58 63 68 73	Ø 64 x 15	Mirror
Available Rockwell HR15W HR30W HR45W HR15X HT30X HR45X HR15Y HR30Y HR45Y scale				
Vickers	HV10	50 100 200 300 350 400 450 500 550 600 650 700 750 800 850 900	Ø 64 x 15	Mirror
	HV30	50 100 200 300 350 400 450 500 550 600 650 700 750 800 850 900	Ø 64 x 15	Mirror
At demand: HV1 HV2 HV3 HV5 HV20 HV50 HV100				
Micro Vickers	HMV 0,1	50 100 200 300 350 400 450 500 550 600 650 700 750 800 850 900	Ø 30 x 10	Mirror
	HMV 1	50 100 200 300 350 400 450 500 550 600 650 700 750 800 850 900	Ø 30 x 10	Mirror
At demand: HMV 0,010 HMV 0,025 HMV 0,050 HMV 0,2 HMV 0,3 HMV 0,5				
Micro Knoop	HMK 0,1	50 100 200 300 350 400 450 500 550 600 650 700 750 800 850 900	Ø 30 x 10	Mirror
	HMK 1	50 100 200 300 350 400 450 500 550 600 650 700 750 800 850 900	Ø 30 x 10	Mirror
At demand: HMK 0,010 HMK 0,025 HMK 0,050 HMK 0,2 HMK 0,3 HMK 0,5				
Brinell	$HB_{2,5\text{-}62,5}$	100 125 (Aluminium soft alloy)	Ø 64 x 15	Polished
	$HB_{2,5\text{-}187,5}$	200 300 400 500 600 (Steel)	Ø 64 x 15	Polished
	$HB_{10\text{-}3000}$	100 150 (Aluminium soft alloy)	150 x 120 x 15	Polished
	$HB_{10\text{-}3000}$	200 300 400 500 600 (Steel)	150 x 120 x 15	Polished
At demand special loads				

A certificate UKAS or DKD is included.

AFFRI CERTIFIED TEST BLOCK TRACEABLE TO UKAS - DKD - SIT

TYPE	SCALE	NOMINAL VALUE	DIMENSION mm	SURFACE
Rockwell	HRC	40 60	Ø 64 x 15	Mirror
	HRB	90	Ø 64 x 15	Mirror
	HRA	70 83	Ø 64 x 15	Mirror
Rockwell superf	HR15N	91	Ø 64 x 15	Mirror
	HR30N	80	Ø 64 x 15	Mirror
	HR45N	70	Ø 64 x 15	Mirror
	HR15T	90	Ø 64 x 15	Mirror
	HR30T	73	Ø 64 x 15	Mirror
	HR45T	63	Ø 64 x 15	Mirror
Vickers	HV10	200 700	Ø 64 x 15	Mirror
	HV30	200 700	Ø 64 x 15	Mirror
Brinell	$HB_{2,5\text{-}62,5}$	100 125	Ø 64 x 15	Polished
	$HB_{2,5\text{-}187,5}$	200	Ø 64 x 15	Polished

Western European Calibration Cooperation

COOPERATING SERVICES

UNITED KINGDOM British Calibration Service (NAMAS), 1968	**BELGIUM** Belgische Kalibratie Organisatie (BKO)/ Organization Belge d'Etalonnage (OBE), 1986
IRELAND Irish Laboratory Accreditation Board (ILAB), 1985	**SWITZERLAND** Swiss Calibration Service (SCS), 1986
ITALY Servizio di Taratura in Italia (SIT), 1979	**FEDERAL REPUBLIC OF GERMANY** Deutscher Kalibrierdienst (DKD), 1977
NETHERLANDS Netherlands Calibration Service (NKO), 1975	**DENMARK** The national Testing Board of Denmark (STP), 1973
NORWAY Norwegian Calibration Service (NKT), 1987	**SPAIN** Sistema de Calibración Industrial (SCI), 1983
PORTUGAL Portuguese Institute for Quality (IPQ)	**FINLAND** Finnish Measurement Service (MSF), 1980
SWEDEN Swedish Board for Technical Accreditation (SWEDAC), 1975	**FRANCE** Système des Chaines d'étalonnage (BNM), 1971
AUSTRIA Österreichischer Kalibrierdienst ÖVE-ÖIAV (ÖKD), 1968	**GREECE** Ministry of Commerce Metrology Department, 1991
ICELAND National Accreditation Scheme, 1991	

NOTES (5x5 mm)